The Builder.

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Private and Public Water Supply.

LIKE the poor, the water question is always with us. From the metropolis to the smallest rural district, there are few places where it is not, even at the present day, a matter of the most urgent importance. The drought of last summer awakened many authorities to the fact that, in view of the increase of population, existing supplies are in many cases inadequate, and that fresh sources must be tapped or new mains laid without delay, in order to prevent a water famine in the near future. Manchester is preparing to lay a new main from Thirlmere to bring an additional twelve million gallons daily to the city; Liverpool is bringing an additional supply from Lake Vyrnwy; Halifax and many other towns are constructing new reservoirs, because their existing waterworks will soon be strained to their utmost capacity. London alone among the large centres of population makes no progress. The wise men who are taking thought for the morrow are like voices crying in the wilderness. Ever since the London County Council was formed, the water question has been the subject of eager discussion, but vested interests and an apathetic Government have thwarted the expressed wishes of the citizens. Whether the present Session of Parliament will merely witness a repetition of the already oft-repeated fiasco of Bill introduced and Bill withdrawn or rejected, or will see some definite step taken towards the provision of a larger and purer supply, no one can say; but there can scarcely be two opinions as to the urgency of the question, in view of the rapid growth of the population and the sources of the present supplies.

It is true that the London water question has been considered by Royal Commissions, by Committees of the House of Commons, by the London County Council, and by many experts, but the last word has not yet been spoken on the subject, and it is interesting and instructive to note the opinions of any persons who are qualified to speak with authority. Dr. Rideal, in the second edition of his valuable work on "Water and its Purification,"* has a good deal to say on the subject incidentally, and what he says is worth careful consideration. In the first chapter, which has been almost entirely rewritten, he points out that rivers are "to a certain extent" purified by the deposition of suspended particles in the quieter tracts of their flow, but adds that "the silt or sediment is apt to be again raised by an unusual current, causing 'storm-water' to be always more or less turbid, as is seen at intervals in many of the London supplies derived from the Thames." The dangerous nature of this storm-water is attested on page 118, where we read—"Dr. Shirley Murphy has shown that in 1894 sporadic cases of enteric fever occurred in London after the delivery of inefficiently filtered Thames water when the river was in flood in the late autumn." In the district of St. George's, Hanover-square, twenty-nine cases were notified in November and December, and only fourteen in the three previous months, when the seasonal prevalence of the disease usually takes place.

Every one knows that the Royal Commission of 1892 gave a valuable testimonial to the London Water Companies: "We are strongly of opinion that the water, as supplied to the consumer in London, is of a very high standard of excellence and of purity, and that it is suitable in quality for all household purposes." It is true that this glowing eulogy was somewhat tempered by a later paragraph, in which the Commissioners expressed their belief that there is no danger of the spread of disease by the use of this water, "provided that there is adequate storage, and that the water is efficiently filtered before delivery to the consumers." Dr. Rideal falls foul of this Report. On p. 123 he declares that "the highest medical and scientific opinions are practically at one in stating that the drinking water of a populous town ought not to be taken from rivers running through cultivated and inhabited lands." Then follows this home-thrust: "No fewer than three of the members of the recent Royal Commission were examined as experts on the Birmingham Water Bill in 1893, and they all expressed this view with more or less emphasis." He also points out—what is well known—that most of the London companies "supply at intervals, and invariably at times of flood, water that is more or less turbid, and therefore has not been efficiently filtered." The obvious conclusion is drawn that if visible suspended matter has passed through the filters, "the more subtle bacteria may also certainly penetrate." In an appendix dealing with some recent epidemics connected with water supply, Dr. Rideal asserts that in times of flood the Thames and the Lea "become turbid and charged with the filth of all the districts drained; then, nothing but efficient filtration stands between London and water-borne disease." He makes light of the argument that, because disease germs have not been detected in the filtered water, this water is invariably safe. At the best, such evidence is merely negative, and against it he declares that "bacilli of the *coli* group, at least some of which are probably pathogenic, have been repeatedly found in the water supplied by certain companies."

Some improvement in existing supplies would probably result if effective control were exercised over the water companies, but in the present state of the law this is impossible. The London County Council is almost powerless in the matter; it has no right to inspect the waterworks, much less to stop a supply, however turbid it may be. Dr. Rideal appears to have little hope of benefit accruing, even from legislation of this kind. "With all precautions," he writes, "London cannot be considered secure while drawing from polluted rivers. 'Our only real safety lies in selecting a pure supply, and in keeping it so.'"

Although it is not stated in definite

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* "Water and its Purification": A Handbook for the use of Local Authorities, Sanitary Officers, and others interested in Water Supply. By Samuel Rideal, D.Sc. (Lond.), F.I.C., Examiner in Chemistry to the Royal College of Physicians, &c. Second Edition. Revised and Extended. London: Crosby Lockwood & Son. 1902.

language, there can be no doubt that Dr. Rideal is in favour of supplying London with water from Wales. The quotations we have already made show that he is firmly convinced that the impurity of the water received by the companies is a continual source of danger. He has, however, very littl to say of the probable deficiency in quantity in the near future. "The observed progressive shrinking of the Thames" is, indeed, mentioned, but more might with advantage have been said on this important question of quantity. More water is urgently required for the flushing of sanitary fittings and for other purposes, and provision for the ever-growing population must be made without delay.

Dr. Rideal's remarks on the London water question are, however, merely incidental. They are interesting as being the deliberate opinions of a man well qualified to speak on the subject, but they constitute a very small portion of his able book. Dr. Rideal is above all things a chemist, and naturally he writes from the point of view of a chemist and bacteriologist and not from that of an engineer. The first three chapters are devoted to a consideration of different kinds of waters, their characteristics, dissolved and suspended matters, animal and vegetable impurities, &c. The next treats of springs and wells, and contains four pages (including illustrations) on the divining rod; the author is evidently preserving an open mind on this much-discussed method of searching for water, and advances an argument from analogy, which, like all arguments of the sort, has little but plausibility to recommend it—"just as the magnetic needle moves towards iron always, but towards copper only when carrying a galvanic current, a fact which we cannot really explain further than by calling it a 'property' of iron, so it is perfectly possible that a rod in the hands of a specially sensitive individual may move under the 'induction' of running water." For "running water" we may substitute iron ore, auriferous quartz, or rabbits without vitiating the argument. Of course, no one denies that water has been found in innumerable cases under the direction of a dowser, but in many districts the difficulty would be for him to find a place under which water cannot be found. Dr. Rideal gives much useful information on springs and wells, perhaps the most interesting being that on testing for the source of the water. Among the soluble substances used for this purpose common salt is the cheapest, but lithium chloride is also used. These, however, cannot be detected by the eye or taste alone, and fluorescin ($C_{20}H_{12}O_5$) is recommended as the best colouring agent; it is an orange dye with a very strong green efflorescence, and is easily visible when diluted with many thousand times its weight of water; indeed, it is said that an entire river may be coloured by a few kilogrammes. As, however, it gives a colouration in alkaline liquids only, soda should be added with it. Commoner dyes are often used, but as many of these are more or less poisonous, they are not suitable for drinking water, or for streams containing fish.

It is commonly said that a cesspool ought not to be constructed within 100 or 200 ft. of a well. Dr. Rideal quotes instances of pollution in wells from distances of 500 yards, and states that the distance of possible pollution has been found by experiment, in the case of "surface wells," to vary from 15 to 160 times the amount of depression.

Rivers, as sources of water supply, are considered in chapter V., and the conclusion is reached that such water should not be used for domestic purposes "if it can be avoided." The following chapter, entitled "Storage," deals with lakes, reservoirs in upland districts, and service reservoirs near the area of distribution. Dr. Rideal concludes that the only waters which deteriorate on storage are those which have been filtered or taken from subterranean sources; the reservoirs for such waters ought to be covered. The possible sources of pollution in distributing mains and in service cisterns and pipes are considered in a separate chapter. Various methods of coating lead and iron pipes are briefly described, and the author states that "so-called linings of pure tin have been found on analysis to consist of an alloy of equal part tin and lead." The danger of lead poisoning is referred to, but no royal road to prevention is shown. There can be no doubt that the only satisfactory method is to compel the water authorities to treat the water in bulk before supplying it to the consumer. In most provincial towns the water authority is also the sanitary authority, and in its latter capacity exercises the power of condemning injurious or dangerous private supplies; if the public supply contains organic acids which act on lead, it may be as injurious as the private supply which has been condemned. Perhaps the best remedy for this state of affairs would be for Parliament to compel every water authority to supply water free from injurious or dangerous matters. In other words, the Food and Drugs Act might with advantage be extended to include the most important of all foods—water.

The subject of "purification on a large scale" is dealt with at considerable length; among the methods described are natural subsidence in reservoirs, chemical and mechanical precipitation, sterilisation by heat and by chemicals, and filtration through sand and other materials. The whole subject is treated in the main from the chemical and bacteriological point of view, but some practical details are given—particularly in the case of sand-filtration—which will be of direct service to the engineer. Household filtration is less fully dealt with; following all recent authorities on the subject, Dr. Rideal condemns the common types of household filters, and adduces evidence to show that the Pasteur (Chamberland) filter is the only one which has proved itself satisfactory under experimental and practical working. The excessive mortality of our troops in South Africa from enteric fever is attributed in a large measure to the defective type of filter employed. This is probably true, but we doubt if even the best filter would have been as effective as sterilisation by chemicals. Professor Notter's experiments with bromine showed clearly that quantities so minute as to be harmless to human beings were sufficient to destroy typhoid germs in a few minutes. Tabloids of bi-sulphate of soda can also be used, as recommended by Dr. Rideal and Dr. Parkes, but are not quite so rapid in action. Such tabloids are very convenient and portable; 350 tabloids, sufficient for nearly sixty quarts of water, weigh only 4 oz. Mobile columns can scarcely be expected to carry porcelain filters in sufficient quantity to be of service, but every soldier could easily carry 4 oz. of tabloids, and the supply could be replenished without much difficulty.

Processes for softening water on a large scale are described at some length, and manufacturers' blocks are introduced to illustrate the most important kinds of apparatus. It has been estimated that a farthing's worth of lime expended in softening hard water saves about thirty shillings' worth of soap, and no better proof of the value of the process need be given. Hard water also has serious effects on steam boilers and on domestic boilers. Dr. Rideal distinguishes between the different kinds of hard water, and gives the results of analyses to show the improvements effected by various processes.

The final chapter deals with the interpretation of the results obtained by chemical and bacteriological analyses, and is of particular interest to the non-professional reader. An appendix of fifty pages contains accounts of recent epidemics connected with water-supply, and tabular statements of analyses of water and boiler incrustations, water-bearing strata, &c. A full index completes the volume. We have said enough to show that Dr. Rideal's book is both interesting and instructive. Although not written expressly for architects or engineers, it contains matter which cannot fail to be of great service to them, and certainly every medical officer of health ought to possess a copy.

NOTES.

The Institute and the Law of Light.

IN an article upon the Law of Light which was published last week, we referred to the fact that the Institute of Architects and the Institution of Surveyors have not yet made any effort publicly to obtain legislation upon the lines of the report of the Committee appointed in 1900, but from the letter of the Chairman of the Joint Committee, in another column, it will be seen that the subject is not being neglected. It is to be noted that Mr. Fletcher Moulton, who was one of the members of the Committee, is a member of the House of Commons, and it would therefore be the easiest thing in the world for the Bill to be introduced by him. We have before expressed our opinion that legislation on the rather drastic lines of that report will not be successful, but a modified measure might be piloted through the House of Commons; at any rate, the discussion of such a Bill would indicate public opinion on the subject, and it is only by the backing of public opinion in some form or other that any measure can now be successful. The bankers long ago obtained a code of the law of bills of exchange, and the pressure of the mercantile community this year compelled the Lord Chancellor to introduce a Bill for the codification of the law of marine insurance. It would be surprising if architects, surveyors, and builders cannot, if they are united, obtain the same success in regard to a measure codifying and improving the Law of Light.

Women as Architects.

WE are glad to see from the opening paragraph of Miss Charles's paper at the Architectural Association, printed on another

page, that the subject, "A Plea for Women Practising Architecture," was not of her own choosing (which we presume means that she was asked to read a paper on that particular subject); as this consideration saves us from the disagreeable task of having to criticise a lady. We think the choice of subject quite a mistake. No good is ever done, that we can see, by papers and speeches about what women can do and what men can do; they prove nothing, and they tend to lead to recriminations and *tu quoques* between the opposite sexes which are as well avoided. The question whether a woman can practise as an architect is one of the class of questions of which it may be said, *solvitur ambulando*. If a woman, at the present day, has properly learned one of the professions which men usually practise, there is no power whatever in any one to hinder her from practising it; she has no need to ask any one's permission; and therefore it is waste of time to argue the point. We should have much preferred to have heard Miss Charles read a paper on some purely architectural subject, her treatment of which would in itself have shown her architectural capacity, without introducing any controversy on the subject of Woman *versus* Man. Taking the paper for what it was, we think Miss Charles's arguments were mostly quite logical, but that two of her imagined objections to women practising architecture are imaginary only. The parallel between women architects and the women chain-makers was not to the point, because the practice of architecture does not in any special way demand physical strength; and the objection that women could not swear at contractors, if seriously put, is also a very imaginary objection. As a rule, architects do not use strong language to contractors; and if any say they have to do so, we should be disposed to think it is their own fault for not having been able to command respect by their ordinary manner. However, we hope that on another occasion we may have an architectural paper from Miss Charles on some subject quite apart from the present controversy.

The Church Crafts League.

WE give a brief report in another column of the last meeting of the Church Crafts League, in respect of which we must say that—with all sympathy with the general object of the League, which is to get the work of genuine artists into churches instead of the "ecclesiastical art" of trading firms—we think their ideas about the way to set about decorating a church need a good deal of revision, and are not likely to recommend them to architects. One speaker at the meeting (Mr. Holroyd) observed that in the fifteenth century it was the custom for a wealthy family to make themselves responsible for one part of the church, and employ the best artist they could find to carry it out; and Mr. Selwyn Image protested against the idea that one man must be responsible for all the decorative work of a church, and said that "if real artists were employed they would all be actuated by the same spirit, and the result would not be lacking in unity of purpose." The best answer to this is to refer the speakers to the Panthéon at Paris, where painters who were all "real artists" but with totally different styles and aims, have been allowed each to do what he liked with a portion of the church in his own; with the result of producing, in a decorative sense, an absolute medley, totally at variance with the general character and expression of the architecture. The reasoning employed is false, because in the fifteenth century in Italy there was much less individualism in painting than there is now, and a church might be decorated in this piecemeal way without producing very violent contrasts. The case is far otherwise now. A single chapel, more or less cut off from the rest of the church, may be decorated by a single artist in his own way, without reference to the rest. But an architectural interior as a whole must, if decorated, be decorated with a unity of style which cannot be secured except under one directing mind; and the decoration must be subordinate to the architectural scheme. Apparently some of the members of the Church Crafts League regard the church only as providing so many spaces for them to decorate each in his own way. In that case we think architects will be wise to keep clear of them.

Water Power in Ireland.

THE paper read by Mr. Tatlow last week before the Dublin Local Section of the Institution of Electrical Engineers on "Irish Water Power and its Electrical Development," calls attention to the fact that water power of considerable value exists in the country, and that the time has now arrived when a careful survey of this power should be made in view of its use for industrial purposes. It is pointed out that, owing to the fact that electric lighting has hitherto been the most important of the electrical industries, the value of this water power has been underestimated. In electric lighting the demand for power is only for a few hours per day, and hence the cost of the fuel necessary when steam is used is only about 30 per cent. of the total costs of the station. For the electro-chemical industries, however, where a steady load is required for the twenty-four hours, water-power plant is very much more economical than steam. Of the 166,000 horse-power expended on electro-chemical work on the Continent 149,000 is obtained from water-power. Mr. Tatlow gives data about numerous places where hydraulic power stations could with advantage be constructed, and we think that the cheap water-power would enable electro-chemical factories to be worked profitably in Ireland.

Windsor Castle.

MANY of our readers, both architects and archæologists, will be interested to hear that Mr. St. John Hope has received the King's command to write the architectural history of Windsor Castle. Mr. Hope has been collecting materials for some years, and we have no doubt the result of his labours will be a work of great value and interest.

The New Stamps.

THE designs for the new postage stamps, so far as issued, certainly do not show any justification for the fact of the Government having gone to a foreigner for their design, considering that England possesses at this moment better decorative designers than any other country. Herr Füchs's inspiration seems to have been exhausted in the first design, which is used for the ½d., 1d., 2½d., and 6d. stamps, only printed in distinctive colours (if the 6d. one can be called a colour at all). This is a simple and good design, with the King's head in a circle bordered by a laurel wreath on the left side and an oak wreath on the right side; the crown at the top. This is suitable and in good taste. The 1½d. stamp, on the other hand, is a very bad design, with no character whatever and in a totally different style from those already mentioned—or rather, no style whatever. The 3d. stamp (yellow) is somewhat better, but is also quite out of keeping with the first design, and very commonplace in detail. Why could not the Government have gone to an artist like Mr. Walter Crane to design the stamps? We should then have had a set of good designs all in the same school. As it is, the results suggest that some one without much notion of design has been trying experiments. Are the 1½d. and 3d. stamps really by the same hand as the others? They do not look like it.

An Italian Water Supply Scheme.

THE *Ingéneria Moderna* publishes an account of the great scheme about to be discussed in the Italian Chamber of Deputies for a main service water-supply in the extreme south-eastern corner of the peninsula. "The general project proposed by Government is divided into five principal parts:—First, a connexion between Caposele and the three provinces of Foggia, Bari, and Lecce; second, a common conduit to the two latter districts; third, a separate conduit for Foggia; and fourth and fifth, similar conduits for Bari and Lecce. In connexion with these five principal divisions will be sixteen subordinate projects. The general estimate amounts to 163,000,000 fr. (6,520,000*l.*) for the work exclusive of the means of distribution into buildings, but comprising the local reservoirs and their communications with the centres of habitation. The expenditure, divided according to provincial requirements, will be:—Foggia, 25,577,000 fr.; Bari, 59,639,124 fr.; Lecce, 77,763,670 fr. The general plan of the aqueduct commences a the springs of Caposele, crosses the Apennines at the pass of Conza with a tunnel of 127 metres, from which point it follows the valley of the Ofanto for a distance of 49,178 km., with a constant fall of 1 in 40. Here the junction is made for Foggia, comprising an open canal of 69,610 km. length with 291,350 km. of piping and twelve reservoirs for twenty-one inhabited centres. From the junction for Foggia the main aqueduct is carried towards Bari for a distance of 213,429 km., with fifteen branches and forty-one reservoirs to supply fifty-six centres. For the province of Lecce a principal canal, 17,881 km. long, with 649,453 km. of secondary communications, will supply thirty-four reservoirs for 141 inhabited centres. The total project comprehends 262,607 km. of principal canal and 1,398,251 km. in the branches. The principal canal is expected to pass through 58,902 km. of tunnelling, 188,051 km. in trenches, 6,873 km. on bridges and arches, and 8,779 km. in metal siphons."

Electrical Traction on Railways.

THE paper on "Electrical Traction on Railways," by Messrs. Morley and Jenkin, attracted a crowded audience to the Institution of Civil Engineers last Tuesday. In

the recent arbitration case as to which of two systems should be adopted for the "Inner Circle" line of the Metropolitan and Metropolitan District Railways, so many problems were raised in connexion with the development of electrical traction in the railways of the country that general interest has been aroused in this branch of engineering. The authors began by giving a general review of the principal systems of electrical traction, and they discussed their respective merits for general railway work. An impartial *résumé* was given of the various direct current and alterna ing current systems. Great stress was laid on the importance of the Ward-Leonard method of working railways by single phase alternating current. The locomotive carries an induction motor which gets its current by the ordinary trolley pole; this motor drives a direct current dynamo, which in turn actuates a direct current motor geared to the driving wheels. In fact, instead of having sub-stations along the line the locomotive carries a sub-station. The beauty of the system is that all the operations of starting, reversing, braking, and returning energy to the line when stopping or coasting, are done by merely adjusting the excitation of the field magnets of the dynamo. The question that has to be decided is whether the advantages offered are sufficient to make it advisable to carry on the train three times the amount of machinery actually necessary to drive it. The authors consider that this system compares favourably with either the direct or the polyphase. In the subsequent discussion Lord Kelvin said that it was no chimerical optimism to suppose that long railway lines could be worked electrically as successfully in the future as short lines had been worked in the past, but he thought that the authors were a little too positive in saying that supply at constant pressure was the only practical way. He recalled how Messrs. Siemens had proposed a constant current system twenty years ago, and suggested that possibly this idea might be worth developing. He was struck by the magnitude of the "skin effect" in iron rails carrying alternating current. Lord Kelvin concluded by thanking the authors for their most valuable and suggestive paper.

The Electrical Properties of Iron.

LAST week Professor Barrett read an abstract of his paper on "The Electrical Conductivity and Magnetic Properties of Upwards of One Hundred Different Alloys of Iron" to the Institution of Electrical Engineers. Professor Barrett and his colleague, Mr. W. Brown, have been engaged for several years past in making an investigation of the physical properties of an extensive and unique series of alloys of iron prepared by Mr. Hadfield, of the Hecla Steel Works, Sheffield. The results they have arrived at are of great value, and some of them have been already published in the "Transactions" of the London and Dublin Royal Societies. They have found out that the addition of even a small amount of carbon or aluminium to iron makes it a very bad conductor of electricity. This has been utilised in the manufacture of wire-resistances for dissipating heat, the wire being an alloy of iron called "resista," which is now well known to electricians. The latter part of the paper deals exclusively with the magnetic properties of these alloys, and Professor Barrett has made some important discoveries. He finds that mechanical hardness and magnetic hardness go hand in hand, and that by suitably tempering steel its magnetic retentiveness can be increased. He also finds that the addition of a very small amount of manganese makes iron practically non-magnetic. Hence it is possible to make steel ships non-magnetic, but the cost would probably be prohibitive. We think that this discovery will be of great value to watchmakers, as they will be able by its means to make non-magnetisable watches as accurate timekeepers as ordinary watches at no increased cost. The most valuable discovery of Professor Barrett is that by adding 2½ per cent. of aluminium to iron we obtain an alloy whose magnetic qualities are decidedly better than the original iron. He showed a rod of this alloy so susceptible to magnetism that the mere magnetising force of the earth made it a powerful magnet, the polarity of the poles being reversed every time it was turned through 180 deg. in the earth's field. In the subsequent discussion Lord Kelvin pointed out that this alloy could be usefully employed in the core of the alternating current transformer, as the great diminution in the core loss would increase its efficiency. Dr. Glazebrook showed the importance of microscopic research in connexion with these alloys, and stated his willingness to continue Professor Barrett's researches at the National Physical Laboratory at Bushey House.

The Hull Town Hall Question.

MR. J. H. HIRST, the city architect of Hull, writes to say that his department is entirely separate from that of the city engineer; he is city architect, and carries out the architectural work, and the city engineer carries out the work of his own department. We presume Mr. Hirst meant that we were inaccurate in using the expression city surveyor, and that he is architect and not surveyor. But we do not see, nevertheless, that the people of Hull should be contented with having a new Town Hall carried out by the official architect any more than we in London are content to have a Government building carried out by the Office of Works.

Belsize Park Estate, Hampstead.

THE fifty houses on this estate of which the leases for terms ranging from fifty to sixty-one years unexpired were offered for sale last week, were erected upon the property appertaining to Belsize House, which was laid out for building purposes about forty years ago. The estate had belonged to Armigell Waade, Clerk of the Council to Henry VIII. and Edward VI., and a famous voyager, for whom some claim the first discovery of the South American Continent. He died on June 20, 1568, and was buried in the chancel of the old parish church, Hampstead. His son, Sir William, succeeded him as Clerk of the Council to Elizabeth and James I. Early in the eighteenth century Belsize House and the grounds became a favourite resort as a place of outdoor amusement, and an advertisement of its attractions, issued in 1720, announces that "For the security of the guests there are twelve stout fellows, completely armed, to patrol between London and Bellsize to prevent the insults of highwaymen and footpads." The gardens were closed and the house was rebuilt about fifty years afterwards; a view of the old house, taken from a contemporary print, is published in our columns of December 11, 1875. In our volume for 1853 will be found a plan of Professor Cockerell's scheme for a northern park, traversed with a ride or boulevard 300 ft. wide, and extending to Belsize and Hampstead, from Albert-road, Regent's Park, sweeping over Primrose Hill to the Eton College Estate and Belsize, and so by the avenue of elms (now Belsize-avenue) to Hampstead Green, thence by Parliament Hill to the Spaniards, near the Heath, and so round by North End and Telegraph Hill to Jack Straw's Castle. Belsize House, at one time the home of Spencer Perceval, stood on the site of the present Belsize-square, and near St. Peter's Church.

Syon Park House, Isleworth.

THIS house, which will be offered for sale by auction at the Mart on Thursday next, is noteworthy as being that in which Shelley was a pupil, in 1802-5, of Dr. Greenlaw, who kept a school there. The house, not far distant from the Brentford station of the Great Western Railway, has a frontage to the main London road; the large schoolroom that lay between the house and the road has been pulled down. At Syon Park House one of Shelley's schoolfellows was his relative, Captain Medwin, and afterwards his biographer, who gives many recollections of Shelley's school life there.

Dudley Gallery Art Society.

THE thirty-eighth annual exhibition of water-colours by members of the Dudley Gallery Art Society contains a good deal of work which is what may be called respectable water-colour art; up to a certain standard in style and execution, but not specially interesting. One or two of the exhibitors, as for instance Mr. Duassut in "A Wiltshire Village" (5), rather too obviously derive their inspiration from Mr. Leader. Mr. Pocock's "Beer Head" (26) is a very good drawing of cliff scenery, Mr. Walter Severn, in "Braemore Deer Forest" (50), shows more of real nature and less of conventional effect than usual. A fine hill picture is Miss Martineau's "Cairngorm Mountains in First Snow" (68), and Mr. David Green's "Flood Tide" (76) is a good sea painting. At the top of the room we come on some of the contributors who have rather a decisive style of their own; such as Miss Jex Blake in "The Cornish Coast" (122—rather *too* broad and sketchy), Miss Drew's "At the Top of the Hill" (124), and Mr. David Green's "Sand and Sky" (134). In "The Evening Hour" (152) Mr. George Marks shows a very beautiful drawing of a village scene, on a larger scale and in a rather different style from his usual exhibits here; two of his beautiful miniature landscapes are, however, to be found on the screen. There is real originality of style and colour in the ship painting called "The Fair Portuguese" (155), a ship with a green hull, by Miss Alice Ellis, whose name we do not remember, but whose work we shall look for again. With this we may group Mr. F. J. Aldridge's fine Turner-like effect of calm and colour "On the Thames" (207), with a bright blue buoy in the centre of the composition which is an important element in the effect. Among other works to be noted are Mr. Duassut's

"Summer Morning" (208); Mr. Stannard's "The Sandpit" (213); Miss Eleanor Brace's "Shadow and Sun" (212) and her clever bit of humour and colour called "Air-balls" (40); Mr. Stormont's "November Mist" (83); Mr. Coleridge's "Deserted Garden" (90); Mr. Tayler's lovely head called "In Celia's Arbour" (98), and Miss Rose Hake's "Morning Light on Beer Cliffs" (87), a fine effect, and a picture exceedingly true to the character of the place.

Society of Fine Arts.

AT the Fine Art Society's Gallery are two collections of water-colour drawings by lady artists, "Irish Life and Scenery" by Miss Mary Barton, and "Flowers and Gardens" by Miss Ina Clogstoun. The former is much the most interesting collection in an artistic sense. At first sight Miss Barton's work seems rather superficial in execution, but it gains upon one on further examination by the fine qualities of colour and composition shown in many of the drawings. The desolate country of Wicklow is impressively shown in "Kilcool Marshes" and "Salt Marshes" (16 and 19). Among other drawings worth special note are "An Old Stronghold, Co. Galway" (6); "Cornfield, Co. Waterford" (20), fine in colour and in breadth of treatment; "In County Galway" (22), an admirably composed landscape; "Sligo Town" (28), with the river flowing between the houses; "Killiney from Foxrock" (31), with its foreground of gorse flowers; a bit of St. Anne's Garden, Clontarf" (55); and "A Cottage Holding, Co. Dublin" (57). Miss Clogstoun's drawings are mostly subjects around which flowers cling; they are somewhat gaudy in colour for the most part, but "The Road to the Royal Villa, Florence" (36), with its dark pyramids of foliage flanking the gateway, and the undulating line of hills beyond, makes a fine picture.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE President (Mr. W. Emerson) presided at an ordinary meeting of the Royal Institute of British Architects, held at 9, Conduit-street, W.C., on Monday, when Mr. F. W. Bedford read a paper on "Baldassare Peruzzi."

Mr. Alex. Graham, hon. secretary, said he regretted to have to announce the death of Mr. James Stevens, a Fellow elected in 1877. Mr. Stevens was a past treasurer of the Manchester Society of Architects, and practiced for over forty years in Manchester. He was sure it would be their wish that a letter of condolence should be addressed to the relatives of their deceased member.—It was also with extreme regret that he had to formally announce what they were all aware of—the death of the Marquis of Dufferin and Ava. He was elected an hon. Fellow of the Institute in 1866, and a letter of condolence had been forwarded to the Marchioness by order of the Council.—Another death he had to announce was that of Mr. E. W. Barnes, a Fellow of the Institute, of Bristol, who was elected in 1882.

The Chairman remarked that the Council that day had directed that a letter of condolence be sent to the Marchioness of Dufferin.

Gift to the Library.

Mr. O. Smith said that through the generosity of persons interested in Gothic architecture and others desirous of honouring Mr. J. K. Colling, a fund was recently formed to purchase the original drawings prepared for his published works in order to present them to the Library of the Institute. The idea originated with Mr. H. Batchelor who recognised the interest and value of these drawings and thought they ought to be where they could be used by students for all time. The great skill, care, and accuracy displayed in these fine drawings, many of them made under the greatest possible difficulties, showed Mr. Colling's intense love of Gothic art. The five volumes would find a suitable home there and be an available mine of interest to present and future students of Gothic art as well as all those who delighted in good drawings. A letter from Mr. Colling would show how greatly he appreciated the idea. Most of the subscribers were members of the Institute, and those who were not had often testified their personal regard of Mr. Colling in that room. He had formally, on behalf of the subscribers, to present the five volumes to the library of the Institute. There were two volumes representing Gothic ornaments; two representing details of Gothic architecture, and one on Mediæval foliage.

The Chairman said he understood the works cost 190*l*.

Mr. Smith said he had had the pleasure of handing Mr. Colling a cheque for 190*l*.

The Chairman: And I think you have been responsible for the getting-up of the subscription list to purchase them?

Mr. Smith said he had done what little work there was to do.

The Chairman said that little meant a great deal, and he was sure the Institute was exceedingly obliged to Mr. Smith for the trouble he had taken.

Professor Beresford Pite said he would like to add that Mr. Colling fifty years ago was the first hon. secretary of the Architectural Association, and they had the pleasure, owing to Mr. Rickman's antiquarian researches in the suburbs of London, of their rediscovered dear old friend and to have him at the Jubilee banquet of the Association in the year 1896. He was quite delighted to find that these charming works were still in existence.

Baldassare Peruzzi.

Mr. F. W. Bedford then read a paper on "Baldassare Peruzzi," of which the following is an abstract:—

The author began by briefly outlining the chief incidents in Peruzzi's life. He was born in Siena in March, 1481, the son of a weaver of Volterra who had settled in Siena. As a youth he delighted in frequenting the workshops of the goldsmiths and others who practised the art of design. At the age of twenty he was appointed assistant to Pinturrichio, who was engaged in painting the chapel of San Giovanni. He shortly after went to Volterra and painted a chapel near the Florentine gate, and then was persuaded to go to Rome.

Here, entering the workshop of the father of Maturino, he greatly impressed his master and other artists by his power of design and painting. Agostino Chigi, a rich Sienese banker, befriended and supported him while he devoted himself to the study of the architectural antiquities of ancient Rome. During his stay in Rome, from about 1503 to 1522, he painted and designed a great many buildings. He then spent some time in Bologna, whither he had gone by invitation of the wardens of St. Petronio, that he might take part in the competition for the completion of that church. From Bologna he was almost compelled to return to Siena to prepare designs for the fortifications of the city. After completing this work he returned to Rome and became engaged on St. Peter's. In the sack of Rome, in 1527, he was made prisoner, was maltreated and shamefully tormented, and lost all he possessed. He was ransomed by the Republic of Siena, and was appointed to superintend the fortifications of that city. In 1529 he was sent by the Pope to help the Papal and Sienese armies in subduing the city. After the war he returned to Rome and became engaged in the erection of various palaces and on St. Peter's. He found time, too, to study astrology and mathematics, and became so expert in the art of perspective drawing as to surpass all other masters of the day. He commenced also a book on the antiquities of Rome, with a commentary on Vitruvius, and prepared many drawings for the illustrations. Many writers speak in eloquent terms of Peruzzi's nobility and modesty of mind, which, however, were imposed upon by his patrons, so that in his old age he was very poor. As he lay on his death-bed, to which he had been brought not without a suspicion of poison, Pope Paul III. sent him 100 scudi and many promises. He died in January, 1537, and was buried in the Pantheon by the side of Raphael.

The author then treated of Peruzzi's architectural works—some still to be seen in Italy, others spoken of by various authors but no longer existing, and others which have been attributed to him. Among the former mentioned were the Palazzi Massimi, admired by Peruzzi's contemporaries, and since held to be among the masterpieces of the Renaissance. The beauty of the plan and the refinement of the details have never been surpassed. The cortile of the Palazzo Massimi alle Colonne is one of the most charming in Rome. A still more famous work is the Villa Farnesina, a work which Baron von Geymüller attributes to Raphael. The author dealt with this subject at some length, and showed the weakness of the reasons adduced by Baron von Geymüller in favour of Raphael as the architect. The piercing of the frieze with windows, as at the Farnesina, was a favourite motif with Peruzzi, and is to be seen in many others of his buildings in Siena and at Bologna. The monotony Monaldini complains of in the architectural details of the Farnesina no doubt resulted from the exquisite taste Peruzzi always displayed when he wished to combine painting with architecture, when he was careful that the structural work should not interfere with the more delicate lines of his brushwork. Having referred to a number of other buildings undoubtedly Peruzzi's, or generally attributed to him, the author next discussed Peruzzi's share in the various designs and plans made for St. Peter's. Vasari states that Pope Leo X., desiring to bring the building, which had been commenced by Julius XI. after the design of Bramante, to a conclusion, and finding the edifice too large, resolved to have a new model constructed; "whereupon he committed the work to Peruzzi, who prepared a new model, which is truly ingenious and of a magnificent character." Vasari on this point is confirmed by Serlio, who publishes Peruzzi's model. Vasari also states that the façade of the principal chapel, which had been commenced by Bramante, was completed by Peruzzi, who constructed it of Peperino marble. Peruzzi was appointed architect to St. Peter's on August 1, 1520—less than five months after the death of Raphael—and held the post until May 6, 1527, and from 1530 to 1531, and again from May, 1535, to January 6, 1537, the day of his death. The author expressed his disagreement with the views of Baron von Geymüller, who states that the plan published by Serlio is really Bramante's, that the plan or model mentioned by Vasari was only a combination of Bramante's nave with the choir of Rossellino, and that most of the drawings in the Uffizi which have been attributed to Peruzzi, one or two of which are signed with his name, were made by Peruzzi for Bramante while he was the latter's draughtsman. That Peruzzi was Bramante's assistant is not recorded by Vasari—who knew both, and who published his book of "Lives" in 1550, only thirteen years after Peruzzi's death—or by Serlio, who was Peruzzi's pupil. That Peruzzi was greatly influenced by Bramante, and was a sincere admirer of his work, on which he founded his own style, is undoubted; but there is no reason to suppose that the many plans and perspective sketches by him were made for Bramante, and were not the expression of his own ideas.

In Siena, Peruzzi's chief work was the rebuilding and strengthening of many parts of the city walls; he built seven towers or gateways, four of which—the Porta Laterina, the Porta Pispini, the Porta St. Prospero, and the Porta Camollia—still remain. His most interesting work in Siena is the Palazzo Pollini, or Celsi—one of the most refined and dignified little palaces in Italy. The Palazzo Turchi, outside the Porta Camollia, was built about the same time as the fortifications and the Palazzo Pollini, for in the cornice, which is of terracotta, Peruzzi has not only used the same enrichments, but has employed the same moulds for the casting. The details of the frieze, architrave, and cornice are almost Greek in their refinement. A number of other buildings by Peruzzi, or attributed to him, were referred to. Many of his designs for the Church of St. Domenico in Siena are preserved in the Uffizi. Leaving Siena, the author went on to buildings designed by Peruzzi at Carpi, Ferrara, Vallepiatta, Viterbo, Bibbiano, and Caprarola. Vasari says that "Peruzzi prepared the design and model for the Cathedral of Carpi. . . . . The structure was built under Peruzzi's direction, and according to the rules laid down by Vitruvius." Baron von Geymüller does not dispute Peruzzi's

authorship, but remarks that the design is founded on the elements of Bramante's design for St. Peter's. The author considered, however, that from the style of the building, from the fact that Peruzzi was in Rome when Alberto Pio, for whom the Duomo was built, wrote to his agent that he was sending the model from Rome, and that several writers named Peruzzi as the architect some few years later, the weight of evidence is in Peruzzi's favour.

The author concluded with some remarks on Peruzzi as a painter. His paintings were classed with the best of his day. Most of them were executed as fixed decorations, and very few of his easel pictures exist. The influence of Pinturrichio, doubtless his first master, is seen in all Peruzzi's paintings. Later he owed much to Sodoma and to Raphael. Some of the paintings on the ceiling of the loggia in the Farnesina are in imitation of stucco-work in relief. Vasari says that he conducted the Cavalier Tizian, a most excellent and renowned painter, to see them, and he could by no means be persuaded that they were painted, and remained in astonishment when, on changing his point of view, he perceived that they were paintings. Some of his most celebrated paintings are those in S. Maria della Pau. They were done in 1515 or 1516, and are strongly influenced by Sodoma and Raphael. The paintings in the Villa Belcaro, which belong to Peruzzi's later years, are among his best, and show great decorative power. They are dated 1535, and are the last he did in Siena. Neither Vasari nor any other ancient writer speaks of Peruzzi's designs for tapestry, but in the collection of Prince Sigmaringen there is a sketch of the "Adoration of the Magi," which was attributed to Raphael, but which is really by Peruzzi. The tapestry is now in the Vatican.

Peruzzi is said to have been the most elegant painter among the architects, and the most ingenious architect among the painters. He was unfortunate in that he happened to live at the same time as the three greatest geniuses of the Renaissance—Bramante, Raphael, and Michelangelo — whose influence permeated the whole of the artistic world, and made it impossible for any other artist to achieve anything free from the charge that he owed the idea to one or the other. But although he learnt much from them, he still preserved more of his originality than his other contemporaries, and infused a spirit of refinement into his work which has never been surpassed. What modern architecture owes to Peruzzi, and what architects owe to him, it is impossible to estimate; but no architect, excepting, perhaps, Brunelleschi and Bramante, did more in the development of the application of Roman architecture to modern times.

Sir Henry Howorth, in proposing a vote of thanks to the lecturer, said he thought the paper they had listened to had been most admirable in every way. He thought the history of architecture had been too much an impersonal history—that they had had the history of buildings rather than the history of the men with the buildings grouped about them which they designed. It would be a grand thing if some man in the future would take a new departure and give them a more personal history of architecture, especially in the Renaissance style, when they knew so much about the personal history of the architects. In the second place he would like to remark what struck him very often—what a curious thing it was how little Rome, until the year 1500, had to do with the arts in Italy at all. The fact of the matter was that Rome was a huge, howling waste. It had been deserted by the Popes, who had migrated to the South of France, and, of course, they all knew of the magnificent remains left behind there. There were hardly any buildings erected at all in Italy between the ninth century and the close of the fifteenth, and what building was done in Italy—to wit, artistic work—was done in the great cities where the merchants were making great fortunes; where Massimi lived, and spent his money with great taste and great knowledge, and did not, like the modern Massimi's, insist on their own vile taste being expressed by the artist. Massimi made the artist the judge of his own art, and left to him the design, and to do what he thought best and finest and right and grandest. Thus it came about that it was at Florence, at Siena, at Vallepiatta, Ferrara, and at Rome that art was kept alive; and it was a fortunate thing that, when the Popes came back, they came back rich, enterprising, and full of vigour; and Julius II., Alexander VI., and Clement VII.—and especially the great French Pope—poured out their money lavishly, and they had the good sense to patronise the real men of genius who poured into Rome from Florence and Siena; and the architecture they had seen that night was the work of those great men. But what struck them was the great versatility of those great men. They were painters as well as architects. The fact that Bramante was a painter had been almost revived in their day, and pictures were turning up here and there showing that he was an extraordinary genius as a painter as well as an architect. What a thing it was to think he died in poverty and misery? Then if they looked at Rembrandt they found like many others he died in a garret. The remembrance of these facts gave point to the aphorism of a barrister friend of his who said he was quite sure that God Almighty showed his utter contempt for money by the people to whom he had entrusted it. Perhaps it might be a consolation to many a poor fellow who had few chances but who had a great aspiring fire in his soul to think that perhaps it might be in the future there might be a revival of the early days which might put him on a pedestal, as had been the case with others. Peruzzi was a friend to Raphael, and although be must have been rather under the shadow of bigger men, they had been able to revive him in this wonderful way, and by the skill of their friend that night. He did rather an impertinent thing in suggesting to the secretary that he had in his small collection of Italian pictures, a picture which came to him in a curious way, and which had been attributed by some of the very great judges to Peruzzi. It was painted in the Chiaroscuro style, of which they had some other examples in his fresco paintings, in which colour was very much to the front. But in the painting they could see how admirably he could draw the figure, and his taste for classical models, and they could notice especially the curious way in which he drew horses. He hoped that Mr. Bedford would write a monograph of the man, and would illustrate it with as many illustrations as possible, and that he would begin a series of monographs of great architects of the Middle Ages, where they would have the buildings grouped a great deal more scientifically than they had been grouped by Fergusson and other people, who simply wrote a history of the buildings apart altogether from the men who designed them. He thought if they got all the buildings grouped under their different authors, they would find them illustrating each other in a way it was impossible to illustrate them by merely putting them into a serial series in which the buildings themselves were supposed to tell their own stories.

Professor Beresford Pite, in seconding the vote of thanks, said he cordially endorsed the suggestion of Sir H. Howorth as to the importance of architects studying the personal elements in the works of the great men of the Renaissance. But personal element had been altogether absent from their knowledge of the preceding architecture of the Middle Ages, and the work of the Guilds, he supposed, was mainly responsible for their loss of that intimate knowledge which became so interest-at a later period. But as they reviewed the work of the greatest men of the Renaissance, the sense of their versatile mastery, and their extraordinary individuality, was almost overwhelming. When they thought of the great men who preceded Bramante, himself a giant, to be succeeded by Raphael, they seemed to pass to an almost superlative individual force when they came to the work and to the personality of Michelangelo. What they had heard that night of Baldassare Peruzzi was equally true of many of those other great men—his extraordinary facility in painting, and something more than facility, because there was evidence of great genius and great power, and great beauty in his work. If Peruzzi had confined himself to painting, his name would have been very closely allied to the position which Raphael's name held. Then there was his work of engineering and his work of fortification, of which they had had a great many other similar examples. Michelangelo designed the fortifications of Florence, which Peruzzi was sent to reduce. All this showed the character of these men. But there was something which came a little nearer home to them, and that was that in Peruzz 's architectural work and in the methods of planning and design they saw a very striking individuality, which was not quite so evident in the works of his contemporaries. They saw in other men's work the progression from mediæval methods to new methods. They were informed that the great architects who succeeded him were being successful inasmuch as they conformed to antiquarian effects then being dug out of the earth. It led him to ask Mr. Bedford what were the Greek studies which he referred to as having been conducted by Peruzzi? It would be interesting to have the reference, because he was under the impression that they derived the whole of their Classic knowledge from what were called Roman remains. Peruzzi drew from the same source and, he imagined, was estimated by the same standard, viz, that he was correct and their own immediate predecessors were correct. What he meant was that he was correct like Street and Scott only so far as they conformed to the accepted type, and he hoped the work of those two men might be as interesting to succeeding generations as his was to them. But we could not trace in Peruzzi's work dead and dry archæology, or that antiquarian example which kept their Gothic revival so hidebound. In Peruzzi's work their was an individual mastery of planning. . . . There was the ingenuity of the planning of the Massimi palace and other buildings where great effects were obtained in little space, and were all indications of a type of mind which was distinctly architectural and, he ventured to say, exceedingly interesting. The same man tackled larger problems. He tackled the greatest architectural problem of *anno domini*—the problem of St. Peter's in Rome. He was sorry that Mr. Bedford had felt himself precluded from entering into that subject, for Peruzzi's plan of St. Peter's was the first plan which showed any complete solidification of parts. Peruzzi pulled the plan together and evolved the fine squareness and largeness of form which afterwards became embodied in Michelangelo's scheme which he evidently approved and benefited by. They must not forget, although they saw practically nothing of Peruzzi's work in existence, yet the fine squareness which underlies the grouping of St. Peter's was first revealed to the world by Peruzzi. Then if they took the elevation of his palaces, how different they were from the common ones of the time—the great wall with enormous cornices and windows scattered about it. But there was a sweet sense of harmony in all his fronts, due to the dignity with which he employed the great basement, and the complete ornamentation and great delicacy. And then Peruzzi delighted in the greatness of his subjects; the way in which he spread his palaces out and repeated them, they had indications of in his pictures. The man's mind moved in large ordered squareness. There was a real sense of dignity in his proportion and line which was of great value, because he imagined in every case it was of set purpose. Peruzzi wanted to be great—his subject did not make him great, but he made the subject great. With such a feeling in his planning of elevations, coupled with the finest of detail and moulding, they had nearly all the qualities which made a great architect, and so far as he had opportunities afforded him he rose to them without exception. Sir H. Howorth had said a great deal which was interesting especially what he remarked about the condition of Rome in the Middle Ages. In many ways the great cities of the world repeated themselves, and he supposed that London now was to the Scotchman what Rome was to the Florentines and the Sienis—they all flocked to it. In Rome there was everything that was beautiful. He was hoping that the day would come when they would recognise that London was to the English the home of art.

Col. Prendergast said he agreed with most of what had been said by the last speaker. What they had to judge Peruzzi by, speaking generally, was the Palace Massimi, and he thought it showed that he was a disciple of Alberti. They were both mathematicians of the first class, and they saw in every line of their works that that was the case, coupled with the extraordinary facility they had of unearthing and measuring ancient work of the Roman period. These two things created a school in the very earliest period of the Renaissance which produced a profound effect on the future of that style of architec-

ture in Europe. He believed it was Mr. Fergusson who acknowledged that St. Peter's at Rome and all the great churches of that style had been originally evolved from the works of Alberti. There was no doubt that the minds of Alberti and Peruzzi ran in the same groove, and Peruzzi, say what people may, had left his mark on the great church of St. Peter's at Rome which could never be obliterated. It was of extreme importance that the rising generation of architects in this country should not be misled. Fifty years ago there was a fatal tradition that led people to despise and almost to hate the style of architecture which was embodied in St. Peter's in Rome, and St. Paul's in London. To his horror and astonishment he took up the *Journal* a few weeks ago, and found an article, written by one who had evidently derived his opinions from this erroneous view of fifty years ago, and, what was more, the editor of the *Journal* was threatening them with some more of that kind of thing. It was of the utmost importance, in his opinion, that the erroneous estimate of the work of St. Peter's should be absolutely obliterated and got rid of. It was of the highest importance that the rising architect should be able to realise what that work meant. There was no doubt that people were beginning to learn the value of this great Renaissance building, and it was desirable to understand the change of public opinion in this matter. He had with him the remarks of John Richard Green, one of the most cultivated men of the time, who visited Rome (I am speaking of the author of "The History of the English People"), and, notwithstanding this old and erroneous tradition which surrounded him, this is what he said about it :—"You would have smiled to see me in St. Peter's, and owning myself in the wrong. I went prepared with all sorts of charges against the façade, and it deserves every one of them. So, too, I had a pocketful of faults to find with the inside until I entered. From that moment, except the waste of the side aisles, I could see none. No interior of a great church ever so satisfied my conditions of taste before. It conveyed the impression of its size, and yet size only lent grandeur to its beauty ; and seen as I saw it, full of light and colour, there was a pervading joy and lightsomeness amidst all its peaceful quiet which I have never felt elsewhere. It was such a sweet bit of irony, this finding in the chief church of what people call dark bigotry and obscure mysteries the brightest and least mysterious Christian sanctuary ever seen." Such is the change of public opinion with which the architect of this new century has to reckon. Moreover, he must not despise the works of these giants of the Renaissance.

The vote of thanks having been heartily agreed to,

Mr. Bedford, in reply, said he was very much impressed with Sir Henry Howorth's words in which he said that he believed in a more personal study of the architectural work of the Renaissance. That view was also expressed by Professor Pite. It was a feeling he had had for a great many years, and it was really the feeling which prompted him to make a study of Peruzzi. It was about twelve years ago now since he spent some considerable time in Siena, and he was much impressed with what he saw there of Peruzzi's work, and afterwards he went to Rome and other towns in Italy, and saw still finer works by Peruzzi, and he thought it would be interesting to study his life and to get to know something more about him, and he thought it was a most excellent way to study architecture. If anybody would take the trouble to take up the lives of the architects and study all their works, he thought it would be a most interesting study. With regard to the Greek studies which Professor Pite spoke of and asked where Peruzzi obtained them, Peruzzi himself spoke of the work which they were digging up in Rome, and many of the masterpieces of which were of Greek origin. There was no doubt that Peruzzi studied them minutely.

The Chairman announced that the next meeting would be held on March 3, when the Gold Medallist for 1902 would be elected and there would be a photographic exhibition, and it was hoped that Sir Benjamin Stone would be present. They would also consider a letter from the Smoke Abatement Society, which had asked their co-operation, and in which it was urged that members of the Royal Institute might join the Society.

The proceedings then terminated.

Professor F. M. Simpson, President of the Liverpool Architectural Society, was specially elected to the Fellowship of the Royal Institute of British Architects at the meeting of the Institute Council last Monday.

THE ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of the Architectural Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, Mr. W. H. Seth-Smith, President, in the chair.

The minutes and some nominations having been read, Messrs. P. W. G. Rudhall, C. K. Roe, and B. Drummond were elected members of the Association.

Mr. H. P. G. Maule, Hon. Secretary, proposed a vote of thanks to Professor Beresford Pite for allowing members to visit Christ Church, Brixton-road, on February 1. This having been agreed to,

The Chairman announced the following additions to the New Premises Fund, *i.e.*—Messrs. Arthur Harston, 3*l.* 3s. ; H. D. Wilkinson, 2*l.* 2s. ; H. J. Potter, 1*l.* 1s. ; and T. R. Hooper, 1*l.* 1s.

The Chairman also announced that a meeting of the Discussion Section would be held on the 21st inst., when Mr. F. C. Eden would read a paper entitled "The Organ : its Proper Position and Architectural Treatment."

Mr. R. S. Balfour, Hon. Secretary, announced the following donations to the Library :—"Sketches from France and Italy," by W. E. Nesfield, presented to the Day School by Mr. Arnold Mitchell ; and the Post Office Directory for 1902, presented to the office by Mr. W. G. B. Lewis. A vote of thanks to the donors having been agreed to,

Miss Ethel Charles read the following paper, entitled,

"*A Plea for Women Practising Architecture.*"

I appear before you to-night with a certain amount of diffidence, as the subject under discussion is not of my own choosing, and I fear I cannot do it justice. The title, to start with, is somewhat misleading. The dictionary says : Plea means a lame excuse or apology. Now I do not propose to offer any lame excuses or apologies, all of which would be unnecessary under the circumstances. I shall merely bring to your notice some facts relative to woman and architecture, with most of which you are doubtless already familiar. Then again, the title seems to suggest that I am conscious of a feeling against women architects, and since I read the paper before your Association, it further implies that I believe such hostility is to be found amongst your ranks. Now I wish it to be clearly understood that I disclaim both of these assumptions. Doubtless your committee had their thoughts directed to the choice of this subject by the knowledge of the existence of this feeling ; but, personally, I have never met it. No one has ever maintained before me that a woman should not practise as an architect, and if this view is held, I venture to think it can only be held by those outside the profession, who are consequently not acquainted with the functions, powers, and responsibilities of an architect.

Since you are members of the profession, it seems superfluous to address you on the subject, as you must know better than any one what are the qualifications necessary for the exercise of the same, and therefore know better than any one that it is not a case of man or woman being best fitted to practise this art, but that it is entirely a case of personal capacity.

In a back number of the *British Architect* I came across the following remark :—"Whether women, as a whole, are fitted to take up the profession of architecture we hold somewhat strong and, it may be, conservative views—views which we do not think it would serve any useful purpose to discuss." I hope very much that some one present holds similar strong and conservative views, and that he will be kind enough to express them to-night, as I may tell you the subject was selected by your committee as being a peculiarly useful and suitable one.

It would be a bold man who would assert that "women as a whole" are fitted to take up the profession, considering so few women have turned their thoughts in its direction ; but it would be a still bolder man who would assert that men, as a whole, are fitted to take up the profession, *vide* the enormities that are daily committed by men in the name of architecture. I repeat, it is not a case of men *versus* women ; it is a case of individual capability and aptitude.

However, there are some people, we are given to understand, who do maintain that woman, *per se*, is unsuited for practising our art. Wherein the weak point lies we shall, no doubt, discover in the course of the evening ; but as far as I can judge it lies outside the woman, and is not a defect inherent in her. I suppose the reason why woman should not practise architecture is because, except in one or two isolated cases, she has not practised it hitherto ; and this is no reason at all.

The same objection is brought forward every time that women have attempted to enlarge their sphere of action, and yet yearly new proofs are given that intellectually women can, at least in many cases, hold their own with men. The results of University examinations show it ; members of the medical profession testify to it ; the legal profession numbers women in its ranks, both in France and in America, though up till now in England women have only been allowed to study for, but not to practise at, the Bar. "Let them study by all means," the conservatives say, "but draw the line at practice." And what is the use of instruction, I ask you, if it is to be turned to no purpose ? What is study without an object ? Knowledge without application ? It is simply creating wants without granting the power of satisfying them. Living is not learning, but applying what one has learnt.

If, then, it is granted that woman is intellectually capable of wrestling with the problems of architecture, are we to suppose that she is physically incapable of carrying on the work entailed ? It were unreasonable to say her strength is not equal to the task when we see what women actually do in this country. Take chainmakers, for instance. Hundreds of women are employed in the very heavy work of chain making, a most arduous trade, and you must remember how two or three years ago certain philanthropists were anxious that legislation should put a stop to this, as they asserted, the work was too great a strain for a woman. This intervention only resulted in the Home Secretary being besieged by indignant deputations of these same women, all protesting their competence and defiantly baring their muscular arms as evidence of the strength on which they prided themselves. Then, again, our agricultural labourers are not by a long way all men. In harvest time, when the work requires to be got through with all speed, women are called upon to labour side by side with their husbands and brothers ; they toil from earliest dawn to latest twilight, through all the burning heat of the early autumn day, and, so far from succumbing to this exposure, they weather it with the best of the men and live to seventy and eighty years of age. Now the bodily fatigue an architect must be prepared to undergo cannot be compared to the physical strain our women endure when employed as field farers or as chainmakers.

I do not mean to make light of the arduousness of the profession. The mere study of architecture involves a great deal of physical as well as mental strain, and since practice means the continuance of study and added to this responsibility, the profession is certainly not one to be adopted by the physically feeble. But women are not all physically feeble, any more than men are all physically strong. You have heard of architects—men—breaking down through overwork, but you would not for that reason say that all men are unfitted to practise the profession. I have never heard of a woman architect breaking down, but neither do I assert that all women are fitted to practise architecture.

Those who base their objections to women architects on the fact that they are an innovation, and therefore to be suppressed, will fling their prejudices and fears to the winds when what is now an innovation comes to be a recognised institution. Already in America one town has a lady for a consulting architect, and we are given to understand that her designs for schools, prisons, and railway stations compare favourably with other similar works in the country.

But there are some opponents who are more specific in their objections, and it is with these we must now deal. Their objections really arise from an imperfect knowledge o what an architect is. The e is a general idea afloat

that architects "make plans" and climb ladders, but beyond these two accomplishments nothing certain seems to be known. The former occupation is acknowledged to be quite a legitimate one for a woman, provided she have the necessary gifts, but the latter cannot be countenanced for a moment, even though she may be sufficiently courageous to attempt it, and can be trusted not to lose her head on the scaffolding. As far as I can gather, it is not the climbing that is objected to, but the fact that she may be *seen* climbing a ladder. Therein lies the difficulty. No less an architect than Wren shows us a way round, if not over, it. The famous Duchess of Marlborough informs us Wren "was content to be dragged up in a basket three or four times a week to the top of St. Paul's, and at great hazard, for 200*l.* a year." No one could object to a woman being hoisted up in a basket any more than they could object to her making use of the more conventional elevator. Climbing a ladder is condemned as unwomanly, but so was riding a bicycle or being seen on the top of an omnibus not so very long ago, and yet all are now seemingly reconciled to these unwomanly practices. Besides, the ladder question could only be raised by persons who are in ignorance of the portion of a lifetime that an architect spends upon a ladder, and, as this is so infinitesimal, it is unworthy of consideration.

But, besides the objector to innovation and the objector to ladder-climbing, there is the man who has dealt personally with architects as their client, and who knows very definitely what an architect is and what he expects from him. He must be a thoroughly artistic, scientific, and practical man. He must be able to design at all possible speed a convenient, durable, and beautiful building of any one of the three groups into which buildings may be roughly classified—domestic, ecclesiastical, and civil. He must have an intimate and familiar knowledge of every material and every trade employed in the realising of the said building, in order that none but the best of its kind and the best of technical skill may be employed. He must be a master of scientific construction, in order to prevent waste of time, material, and money. He must keep all accounts relating to the work, bear in mind the interests of client and contractor, and manage everything without allowing any friction to come about between the different parties concerned. This list is not complete; I have mentioned but a few of the functions required by an employer of his architect. For the sake of argument we will suppose that they appear to offer just so many obstacles to a woman following the profession.

I use the word "profession" because it covers more requirements than art, craft, or faculty, and though it has been weighed and found wanting, it appears to be the word in most general use when connected with the practice of architecture.

To succeed in architecture one must be, as I have said, artistic, scientific, and practical in business matters; that is to say, success is largely a matter of natural gifts, education, and experience. Now, who will assert that the necessary gifts are not and cannot be possessed by woman; that she does not receive the requisite general education, and that experience may not be acquired by her as well as by man.

Let us look first at the æsthetic side of the question. Architecture has been defined as good construction inspired by an artistic motive or by the instinct of the beautiful. Now this instinct of the beautiful, or, as the French put it better, *ce sentiment du beau*, is as a rule more strongly developed in the woman. Nearly every woman is more or less impressionable, that is, she is an artist by temperament. Her taste will lead her instinctively and intuitively to a result which a man will reach by a series of criticisms and reasonings. He sees the truth, she feels it. The beautiful is attained by both, what matter if the paths they follow are different.

In most cases (outside the profession, be it understood) who is it who cares to be surrounded by beautiful objects and attempts as far as is possible to make the home a thing of beauty? It is certainly not the average man, who so long as he is comfortable cares little for the appearance of his surroundings. It follows, then, that it must be the woman, who will cheerfully sacrifice even comfort to her conception of beauty, if any choice have to be made between the two.

Some people go so far as to say that a woman must necessarily know how to plan a house better than a man, because her household duties suggest to her the wants and requirements that must be met. We do not agree with this view. The best housekeeper in the world may have most definite ideas as to what she requires, but she will not produce a plan, that is the suitable disposition of spaces, till she have learned what rules and precepts must be obeyed in planning a house. And these rules, being all based upon common sense and obvious reasoning, are as patent to men as they are to women.

We must not, however, lose sight of the fact that the influence of woman in domestic architecture has been felt ever since the progress of social relations made her the equal instead of the slave of men. Woman's position in a country is the surest sign of the social progress in that country, and it was in the sixteenth century, when women began to be respected "as a whole," and not in individual instances, that domestic architecture regained its prominence. It was when a woman ruled this country, and by her personality influenced many, that castles, cathedrals, and colleges—buildings designed for men by men—ceased to be the most important architectural objects erected. Elizabeth's reign is remarkable for the number of radical changes which took place, and in no direction was the change so marked as in architecture.

At the time when, under James's rule, the Scotch were dwelling in fortresses about as comfortable as a Norman keep, the English under Elizabeth were vieing with each other as to who should build the most roomy, most convenient, and most beautiful houses. It is noteworthy that the great Queen spent not a penny herself in the interest of building, but she gave her noblemen much moral support, encouraging them to spend their thousands in erecting palaces worthy of receiving her as a guest. One of the most indefatigable builders of that time whose name has come down to us was a woman, Elizabeth of Hardwicke. Of the "three most elegant seats that were ever raised by one hand," so says her biographer, only Hardwicke Hall remains, and judging from its monotonous symmetry and extravagant window-space, we have, it seems, little cause to regret old Chatsworth and Oldcotes. Besides her three country seats, this lady left "stately almshouses for twelve poor people" in Derby, and personally superintended the construction of "a splendid mural monument" to her own memory in All Saints' Church, Derby. Her biographer, alluding to her passion for building, describes her as "a woman of a masculine understanding and conduct; proud, furious, selfish, and unfeeling." Apparently we are to gather that these unattractive qualities, pride, violence, and egoism, go hand in hand with a masculine understanding. If, as Hardwick shows, she lacked artistic feeling, she was, on the other hand, a thoroughly practical woman. Of the four husbands she outlived, three were wealthy men who were able to supply her with the means of indulging in her favourite pursuit.

In France, where women stand out more prominently than in England, and during the early Renaissance, when they were most conspicuous even as politicians, warriors, and poets, we find them occupied with building at an earlier date than at home. Marie de Pierre-Vive, Dame du Perron, one of the ladies of the household of Catherine de Medicis, was officially associated with Philibert de l'Orme during the erection of the Tuileries. In 1566 her name stands among the list of "MM. les Surintendants des Bastiments du Roy," and it is interesting to note that where she and de l'Orme signed papers together, Dame du Perron's name comes first. Her Royal mistress was another woman of "a masculine understanding," and insisted on her own plans being used for her palace. De l'Orme writes to her "Lequel Palays je conduis de votre Grace suivant les dispositions, mesures et commandement qu'il vous a plait m'en faire."

But however artistic a woman may be, her natural gifts alone will not suffice any more than will those of a man, without study and direction. Art has its restrictions and its limitations, which must be recognised and appreciated if truth and nature are to be our guides; and architecture is particularly restricted and limited in theory and in practice. In theory it is bound by those rules of art inspired by taste based on traditions, and by those rules of science which can be demonstrated by invariable and absolute formulæ. And in practice it is limited by structural conditions, which, if neglected, result in the collapse of the building; it is limited by the physical properties of material, by the climate, by the habits and necessities of the moment.

Study of aesthetic rules produces fine designs, and study of scientific laws produces fine construction. Construction demands a knowledge of the principles of mathematics, besides a knowledge of the properties of building materials. Now, mathematics involve logic, or the science of reasoning correctly, and hitherto logic has been held to be the peculiar inheritance of man as opposed to woman. It may be freely granted that among uneducated women, possibly a larger proportion are more illogical in their every-day conclusions than among an equal number of uneducated men; but it by no means follows from this that the brain of the average woman of education is less capable of mastering the science of logic than that of the average man of education. Now, we are only discussing cultivated women, and all reference to the uncultivated and illogical class is beside the question. That logic can be mastered is proved by the successful results achieved by women at the Universities, where they show peculiar aptitude for the science of mathematics, the numbers who devote themselves to this study being great, out of all proportion to those who select other schools or triposes. Again, at the École des Beaux-Arts, where the architectural course includes, besides an immense variety of other subjects, a very high standard of mathematical ability, a woman, an American, has lately had the honour of carrying off the Premier Prix over the heads of her brother students.

But pure mathematics are of little use without familiarity with the properties of building materials, and this familiarity, it is argued, can only be gained by a technical knowledge of the trades employed in building. In the Middle Ages the architect was only distinguished from the workman by conspicuous natural gifts and greater skill in technique; he who was most familiar with his materials produced the finest designs. The workshop was then the training-ground for the embryo architect, and doubtless would have proved a rough school for a woman. But now, however much the fact may be deplored, most of the architect's work is produced in an office, and not in a workshop, and is due more to his intellectual activity than to his manual skill in any trade. If, then, good design depends upon the proper use of material, and this use may only be learnt through handling it, how comes it that fine designs are produced by men who are in no way fitted to work with such material, and that, on the other hand, most of the builders who dispense with the services of an architect, and many of whom are skilled in one or more trades, produce crude results which, though they strive after, fail to realise architectural effect? The answer is simple. It is largely a matter of education and preparation which enables the sharpened intelligence to grasp more readily the principles of technical skill. This general education is indispensable to architectural study, and since there is but slight difference now-a-days in the course of education pursued by men and women, I cannot see that the absence of workshop training should now-a-days hamper a woman more than it does a man. Do not mistake my meaning. Education cannot create the gift of design, for designers, like poets, are born not made; but it fosters and encourages this gift and calls out the highest faculties when they do exist in the student. No amount of training will make the deaf and dumb to sing; but, for all that, training is invaluable, not to say essential, to a singer who means to do his voice justice. If I may be allowed a misquotation:—

"Books, gowns, degrees will leave a fool a fool,
But designs are best when the designer's been to school."

Granted, then, that woman is fully competent as far as the æsthetic and scientific sides of the profession are concerned, there remains the economic side to be considered. This covers all the business transactions that take place between the architect, client and contractor, and involves the exercising of a large amount of tact in order to make matters run smoothly. Without tact a business man will not go far, and this indispenable quality seems universally acknowledged to be dealt out more generously

to woman than to man. In France, every woman is born a business man, and her taste is never questioned, whereas in England it is the exception to find a man who combines artistic talents with business qualities.

The stumbling-block in the business seems to be that the architect is responsible for the quality of the work done and so has to oversee and direct the workmen. This, for some reason, is supposed to be beyond the powers of a woman; I am told it is objected, she cannot use the necessary amount of strong language to keep the workmen up to the mark. But surely there are other ways of enforcing your will than through the medium of unseemly language. There is not one man in twenty who has realised that gentleness may be a force. A man will boast of his want of self-control; he flatters himself that abusive language shows him to be a man of strong character, a master; he would count himself less manly were he less violent, and yet you must confess that some of the gentlest men you know happen to be those who always get their own way and compel people to carry out their wishes whether they will or no. St. Paul's Cathedral, one of the finest examples of Renaissance work we have in England, is a living example of what workmen can produce without the stimulus of abuse. Wren had the "ungodly custom of swearing" in such abhorrence that he posted up an order to the effect that, upon sufficient proof, the clerk of the works should dismiss any labourer guilty of this crime, and further that "if any master working by task shall not upon admonition reform this profanation among his apprentices, servants, and labourers, it shall be construed his fault, and he shall be liable to be censured by the Commissioners." Besides, swearing at one's subordinates is really not as fashionable as it used to be. In the Army and the Navy, where formerly the slightest order was accompanied by a volley of oaths, the change is strongly marked, and the officer who now so far forgets himself as to swear at his men lays himself open to a severe reprimand from those who are of superior rank to that which he holds.

I think I have touched upon most of the points which might be brought forward as objections to women practising architecture, and I trust we shall all be agreed that the obstacles are more imaginary than real. But there is one other point I ought to refer to before closing, and that is the "new style" some people are clamouring for. Since women began to study architecture it has been suggested that they may supply this pretended want, but as yet there has been little to warrant the conjecture that the fresh inspiration will come from that quarter. Women make intelligent interpreters and passionate disciples, but, to judge from the testimony of bygone centuries, their power stops short at creation. It may be wrong to assume that woman is totally wanting in inventiveness, and it may all be a question of upbringing and training. Hitherto men have always led the way, for the race is to the swift and the battle to the strong, and men have been the swift and the strong since women's upbringing taught them only dependence and reliance, and in no way fostered originality. But now-a-days women are expected to think and act for themselves, and this self-dependence and self-reliance may prove to be the generating spark which will rouse to activity the originality and creative power which, for all we know to the contrary, may have long lain dormant within them.

But in any case this want of creative faculty would not hamper a woman architect. Architecture is a logical art, and no change has taken place in it without a very obvious reason, and when no reason can be adduced for original and capricious designs, such productions are grotesque and not architectural. The truest architects are not distinguished for brilliancy of invention so much as for careful attention bestowed on the smallest details of their work, and women, "as a whole," possess the faculty of worrying out details so small that they often are apt to escape the attention of the more comprehensive mind of men.

If I do not stop now you may go away with the impression that I consider women more fitted to practise architecture than men, and nothing could be further from my thoughts. May I, in concluding, repeat what I said at the beginning of my paper, that it is not a question of men *versus* women, but that it is entirely a case of the capacity of the individual.

The Chairman, in inviting discussion, said they must all congratulate Miss Charles upon her admirable paper and the admirable manner in which she had delivered it.

Mr. Arnold Mitchell, in proposing a hearty vote of thanks, said Miss Charles had presented her case so clearly and fairly that she went a long way to disarm criticism; at the same time, they were there to discuss the paper, and Miss Charles would be the last to complain if the views which they might give expression to were different from those which she held. He had been struck by one remark in the paper, *i.e.*, "Art has its limitations." So had sex. It was all very well to deal in generalities, but of course it was the smaller matters which they were concerned with in dealing with this problem—for undoubtedly it was a very serious problem, and one which was likely more and more to become a pressing and burning one, *i.e.*, this problem of sex and of the woman taking up work which the man up to the present had been accustomed to consider his own particular province. What did one mean exactly by "the limitation of sex"? It was a difficult thing to define, but take an illustration from actual practice. The architect had to deal on the one hand with his client and on the other with his builder. The architect, in dealing with his client took that client's instruction, prepared the scheme in accordance with his client's wishes, and gave all the thought and skill to the work of which he was capable; so far he could go with Miss Charles in saying that, given equal education and natural ability there is no reason why a man should do better than a woman; but there were other people to deal with besides the client. There was the contractor, for instance, and it seemed to him that it was here that the limitations of sex came in. A woman architect would have to go to a building that she was carrying out, and she might have to reject material, perhaps. Now, however much we might disagree with the point of view, it was a most difficult thing under such circumstances for a man to take orders from a woman, more particularly when there may be an honest difference of opinion. All nature in the man seemed to resent accepting such orders, and with all the tact in the world difficulties, which he thought were insuperable, would occur in the actual carrying out of the work. One might crystallise this point of view by saying that women might do designing work as well as men, but that the execution of the work was outside their powers. Even if one eliminated the contractor, with the inevitable dealings with the foremen and with men, it was impossible to conceive circumstances under which a woman could always be successful in those dealings, and without continuous success she could not hope to make a success of her practice. No doubt there were other views to be brought forward, but beyond this question of the limitations of sex he did not see that they need go. It required much thought and preparation to be enabled to discuss properly the question raised by a paper which had been thought out so carefully. There was one point, however, that he might refer to, and he thought that most of them would be in agreement with what he had to say. It was in reference to the bogey Miss Charles had set up only to knock down: the bogey of strong language. He had had twenty-three years of architectural experience, and he had never, either as assistant or in his own practice, or acting with other architects, heard a single word of strong language—that was to say, swearing—used in condemning materials or in dealing with men. It was a bogey of Miss Charles' invention, but it ought never to have been put up. They must all of them have felt it to be a great pleasure to listen to such an admirable paper, and they must all heartily thank Miss Charles for the trouble she had taken and the courage she had shown (for it did want courage to address a body of men on a subject such as this, where some opposition might not unreasonably be expected.

Mr. Leonard Stokes, in seconding the vote of thanks, said it was not often that they heard such an excellent paper delivered with so much sense and understanding. Miss Charles had certainly taught them a lesson in delivery, and she had shown that a woman could be, at any rate, thorough; and if she had shown nothing else she had distinctly shown that a woman could beat a man very often in thoroughness. Whether it was due to cricket, football, billiards, and perhaps smoking, he did not know, but men, as a rule, did not seem to be so serious as women, and the success of women in some directions had shown that men must look out if they were not to be left behind. Whatever woman took up she seemed to put her whole soul into, and men did not always seem to do the same. Miss Charles said that men were responsible for a vast amount of ugliness all round us; that was perfectly true, he was sorry to say, but Miss Charles had not shown, for she could not, that if women architects were in the same proportion to men architects, there would be any less ugliness in architecture. That remained to be proved. At all events, Miss Charles had made out a very good case for allowing women to try what they could do. As to the question of strong language, he was glad that Mr. Mitchell had heard so little of it, but that was not the experience of all of them; in any case, he thought Miss Charles scored a point in saying that persuasiveness was often quite as effective as anything else, and in his opinion it was not at all necessary for violent language to be used when one went on to the works. It was not easy, however, to imagine how a woman was to deal with a difficult contractor. Perhaps it would prove to be quite an easy matter, but as it was hard enough for a man to do so sometimes, it would seem to be still more difficult for a woman to overcome that difficulty. Of course, a woman had sometimes to deal with a cantankerous cook, and a cantankerous cook was as difficult to manage, perhaps, as a cantankerous contractor; but, still, the fact remained that women, as a rule, could not bring themselves to put their foot on a cockroach, and how could they then be expected to put their foot down upon a contractor when it was necessary? As to climbing ladders, it might be that women could do so as easily as they rode bicycles, but we were certainly not used to seeing women climbing ladders. That might be old-fashioned, and we might get used to the innovation, but, in any case, it was essential that a practising architect, whether man or woman, had to get about the building. In a large work the clerk of works might be looked to to do a lot of that getting about, but on a small building on which a clerk of works could not be afforded, the architect ought to do it. A man could easily do so, could a woman? He did not know whether it would be possible or desirable to provide a basket for her always in place of the ladder. But even if a woman escaped the scaffold business, there was the awful problem or prospect of matrimony, which upset so many plans and calculations. A woman took up some pursuit or profession with a light heart and made great preparations by study and hard work, and then this business of matrimony came along and upset everything. If a woman architect thought she could carry on her practice as well after as before marriage he was afraid she would find she could not—that was if things were to be done as they were now. As a woman was expected to look after her house—of course that might be considered an unreasonable expectation; but so long as it was expected, he did not see how she could, if an architect, look after her practice as well: either house or practice would have to be given up, or both would go to the dogs. He supposed that Miss Charles would agree that when a woman married it was one of her duties—he did not know whether it was her first duty—to keep a more or less happy home over her husband's head, and he was afraid that if she looked after builders and climbed scaffolds her husband would be made somewhat uncomfortable. Another little difficulty which appealed to him somewhat was what a woman architect would do if she had to travel a long distance to attend a work—say to Ireland or Scotland. She would have to put up at little inns, and would that be agreeable to her? And was she to take a chaperon with her or not? And would she mind driving across country (as a man architect frequently did) with a mere man driver? Was she to do this, and, if not, would she be thought foolish for not doing so?

Mr. R. H. Weymouth, in supporting the vote of thanks, added his testimony to the excellence of the paper, and to the way it was read, but, he said, he did not think the paper had carried conviction. He thought Mr. Mitchell had indicated how far it was possible for a woman to go in work, and he (the speaker) held very strongly that it was undesirable for a lady architect to superintend work generally. At the same time with regard to

office work and designing and planning, it was quite possible that such work could be done admirably by women, and he saw no objection to that. Miss Charles, in her reference to the thoroughness with which women went into detail, seemed to suggest how far a woman might practise architecture, *i.e.*, in the smaller matters connected with house-planning—matters like cupboards, fireplaces, dressers, kitchen and scullery arrangements generally; all the matters, in short, where minutiæ were necessary, for they had an aptitude in that direction which was unquestioned. All architects knew, especially in connexion with early practice, how difficult it was to satisfy the lady client in such matters as dressers, cupboards, and things like that—things which helped to make a house comfortable—and often the arrangement of such matters was left to the builder, who did the work badly, and the architect got the responsibility for it. In all that sort of work, which did not necessitate going upon a building in its rough and uncouth state, or climbing ladders and scaffolds, &c., there was an admirable field for the lady architect, and in that sphere she would, as a rule, be better able to do the work than men. Decorative work, and inside details and finishings, which fell into the hands of architects, and which a great many men did not know how to do properly, could very well be left to women. He felt that the "rough and tumble" of life was for man, and that the more refined and less arduous work, in the main, was for women. As to women who did chain work and other laborious work, the sooner that was altered the better. Though it might be old-fashioned, he did not think that women should be called upon to do such work. He did not think there need be any clashing in a division such as he had suggested of architectural work.

Mr. Butler Wilson, having congratulated the lecturer on her paper, said they were in the habit of hearing in that room that there was a difference between building and architecture. He was of opinion that, fully to carry out the duties of an architect in the highest sense, it was impossible for any one man to cover the whole of the ground. The same fact had been shown in medicine and other professions, and it had been gradually proved in architecture, as they saw around them. They found one man building asylums, and another man building houses of such a character as to fill the asylums. He always thought, in regard to the interest of women in architecture, that if there was one department in which woman might come in as a specialist it surely was in domestic work. The several apartments of a house were very often designed with the idea, he supposed, of being left to the builder to finish off, and the furniture, &c., which should be artistic and elevating in its tendency, was often selected without any such consideration. Any of them who had had much to do with housework knew that there were occasions when they not only selected the pictures for a man's house, and even paid for them, but they bought and fixed his furniture and ornaments for him, and, in short, they made what they felt was a home when they left it—they often felt it was a home to them, but how often was it a home to the owner? It was often a very uncomfortable place. Now, a woman "architect" might very well take the place of a man in such matters and be more successful, for, having more leisure than a man, as she probably would, she could consult the client more, and not only get to know his wishes, but could make suggestions, and might, in that way, gradually improve the taste of the public in matters of design. There was a field for the lady architect or lady decorator; he was rather inclined to think that decoration was the largest part of architecture.

Mr. H. P. G. Maule, having referred to the lucid and logical character of Miss Charles' paper, said it seemed to him that the whole point of the matter was summed up by what Miss Charles said, *i.e.*, "It is not a case of man or woman being best fitted to practise this art, but it is entirely a case of personal capacity"; and so it was. If any woman had a desire and a feeling to "scorn delights and live laborious days," why should she not? If she had a desire to practise architecture and a wish to see if she could overcome a fractious and disagreeable builder, why should she not? If they tried and failed, they would drop out, for success came, as a rule, only to those who had capacity. But by all means let them have the opportunity of trying what they could do. John Stuart Mill said, "Institutions, books, education, society, all go on training human beings for the old long after the new has come: much more when it is only coming." Do not let that be the reproach against architects, though he thought there would be less likelihood of that reproach being necessary after the paper they had listened to that evening. As an Association he thought they might be congratulated on being the first body in this country representing architecture before which a paper by a lady had been read. To open up the study of architecture to women, and to give them an equal opportunity with men, was not only justice, but it doubled the chance of finding those who could do good work. As Miss Charles said, there were a great many men who did not do good work, and no doubt there would be many women who would do the same if they practised architecture, but the chance of getting good work was doubled, and for that reason alone the opportunity should be given to women to practise architecture.

Mr. F. T. W. Goldsmith said that Miss Charles had looked at the matter from the right point of view, viz., that in so far as a woman was intellectually fit to do architectural work, she should be allowed to do it, and that in her own way. Miss Charles did not say that every woman was qualified to be an architect, and while she pointed out that architectural atrocities had been perpetrated by men, she did not say that women would, taken as a whole, do better. So long as a lady architect remained single he saw no reason why she should not carry on the work of superintending the erection of her buildings just as a man did, and he thought it might in some cases be an easy matter for her to deal with the builder. A married man architect, as a rule, knew that a woman's resource in the management of her home had never been surpassed by a man in dealing with a contractor. At the same time the resource and management he referred to were exhibited in the privacy of home and not in public, on the scaffold, or in the midst of a number of workmen. He did not think that any woman would be able to tackle a contractor on the job, under the gaze of unsympathetic clerks of works, foremen, and workmen, in the same way that she was able to tackle her husband in her own domain, her home. That was one of the sex limitations which had been referred to. He could not help thinking that if women architects became as general as men are to-day, they would be a varying quantity. Sometimes there would be a great many of them practising, at other times, in the natural course of things, through marriage, there would be fewer. He did not think a client would appreciate the enforced absence of his lady architect from the work because she had a family and a home of her own to attend to, nor would he be willing to pay 5 per cent. to a lady architect who could devote only half her time to her employer's interests. That seemed to him to be another insuperable obstacle in the way of lady architects becoming general practitioners. It had been said that evening that lady architects would be very efficient in the work of an office, in decorative work, &c., and it was suggested that they should confine themselves to those duties. Now that course he objected to very strongly. An architect ought not to dissociate such work from the general outside work of his practice. If a lady architect were to do the decorative work and other work that had been mentioned, and the poor man architect were left to do the mere shell of the building, they would, perhaps, find by and by that the lady was doing the whole—and quite right too in those circumstances. What a lady might do if she wished to join the profession was to act as a sort of consulting architect, as was the case in America, he believed, and not to expect or be willing to act as architect in the ordinary way. If a lady architect would be satisfied with that there was a field open to her, and the profession would welcome her assistance. Miss Charles referred to a feeling against women architects. He was bound to say that there was a very strong feeling against them, and that he possessed that feeling, based upon practical experience; but that feeling was not against lady architects *per se*, but against unqualified lady architects — against those ladies who passed from designing decorative schemes, &c., into the practice of architecture without the proper qualifications, to the detriment of their clients and their work. In conclusion, he desired to add his testimony to Miss Charles for the fearlessness with which she had propounded her principles and for her excellent paper. He hoped that her career as an architect would be a successful and brilliant one.

Mr. F. W. Marks said that the only thing against ladies practising as architects with any success seemed to be their sex.

Mr. H. A. Satchell, in supporting the vote of thanks to Miss Charles for her excellent paper, said that in discussing whether ladies should enter this profession, or any of the few professions they had not already entered, one was sure to be met with the retort that one's objections were only the same or similar to those which had in the past been raised against the admission of women to other professions, and women could point with pride to the success they had achieved in the professions of medicine and law. He thought the objections to ladies practising as architects were not made from any selfish point of view, for it would be unkind of men architects to let ladies who were anxious to enter the ranks of architecture think that the profession was a bed of roses, and he was glad that the sex difficulty had been alluded to. As to dividing up architectural work, as had been suggested, he thought that would be very undesirable. There was sure to be more and more specialism as time went on, but it would be a great mistake to call ladies architects if they were to be mere specialists. All would feel sympathy with ladies who studied architecture in order to take an intelligent interest in the work of their male friends, for it added to domestic enjoyment when an architect's wife could discuss her husband's profession with him in an intelligent way. There was one way out of the difficulty, and that was collaboration, as suggested by Sir Walter Besant in reference to novel-writing. Sir Walter contended that lady novel-writers' as a profession, were a failure, but that the highest success in that sphere was obtained by collaboration—the collaboration of man and woman. That arrangement, however, according to Sir Walter Besant, was unfortunately not always a success, because it often ended in marriage, after which the lady had no time, and yet she objected to any other lady taking her place.

The Chairman, in putting the vote of thanks to the meeting, said they all knew how qualified Miss Charles was to speak to them. She had been through the whole student's course for qualification as an architect, and she had passed the Institute of Architects examination, and for that reason they could not lightly set aside what she had to say to them. It was remarkable that they should be asked to recognise the admission of ladies to be competitors with them in such a highly technical art as architecture; and it was an important subject, not only because of the novelty of the proposed departure, but also because of the large preponderance of women over men in this country. A very large number of young women had no object in life at all of an intellectual character, which was a very sad fact, and it would be a delightful thing if some of them would, or could, devote themselves to a study of architecture; whether they practised it in the future or not. From that point of view he thought they should encourage the study of architecture among women. It would add enormously to women's interest in life, for the intellectual field an architect had to travel before he was qualified, and the delights which that knowledge would give, were enormous. Moreover, if she remained single it would be the means of providing her with a livelihood, and if she married an architect she would be able to enter more into her husband's life and work than she could at present. Although it might be said that women had been emancipated intellectually for centuries, it was only about fifty years since that they had been really educated, and now they were carrying off some of the first honours at our universities, while in America they practised as consulting architects. They could not but feel sympathy with Miss Charles's views, and possibly they might find them become more general in the future. Perhaps the most important point touched upon in the whole discussion was the essential difference between men and women, and the difficulty of men dealing with women in business matters exactly on the same footing as they would with men. While the spirit of chivalry remained—and long may it remain—it was difficult for a man to

treat a woman exactly as he would a man in any matter of business. Moreover, it was quite conceivable that some women would take advantage of a man in such circumstances. The question of the admission of women to the study of architecture in the Association had been discussed under the presidency of Mr. Mountford, when one or two ladies were nominated for membership. The Committee came to the conclusion that ladies should be admitted to the classes of the Association as students; whether they were to be given the whole run of the privileges of the Association was another matter. The Committee thought it would be to the advantage of the Association, and it must not be forgotten that ladies were admitted to all the classes of the polytechnics, associating on common grounds with the men in those classes. When the Committee's views were placed before a general meeting of the Association, however, those views were rejected. Perhaps the members of the Association thought that women would be important competitors, and that they would be willing to take less than the usual commission for their services. That always had been a difficulty with women's work in the open market. He was sorry that Miss Charles weakened her arguments by stating that women never had been creators or designers, for that was the whole question before them that evening. He quite agreed with her that there were few women who had achieved renown as musical composers, but as decorators they had come very much to the fore in designs for wall-papers, fabrics, metal-work, &c. Considering how recently women had entered these branches of work, the results pointed to successes in other directions. One point which should be remembered was the probability that if women were admitted to the profession, or to certain departments of it, the public would be more quickly influenced in matters of taste than in any other way. Women had far more opportunity than men for putting their views on such subjects before the public generally, and the great stumbling block in the way of progress in architecture was that the public were so unappreciative of art, especially the art of architecture, which was not taught, even scarcely hinted at, in any of our public schools or universities.

The vote of thanks was then put to the meeting and very warmly agreed to.

Miss Charles, in reply, said very little remained for her to say, for one speaker had answered another. Her paper was said to be not conclusive. How could it be? She had no proof to offer, and one must have proof if one wanted to be conclusive. For 6,000 years women had been sat upon by men, and they could not all of a sudden show what they could do; they must be educated up to it.

The Chairman announced that the next meeting would be held on March 7, when a paper would be read by Mr. J. Miller on "The Glasgow Exhibition."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

II.—ROYAL COLLEGE OF SCIENCE AND VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON.

ON the 15th inst. the second spring visit of the session of the Architectural Association was paid to the Royal College of Science and Victoria and Albert Museum, South Kensington. A large number of members met at the Royal College of Science opposite the Imperial Institute, where Mr. Aston Webb, the architect, kindly met the party. A plan of the building had been put up on a screen, and Mr. Webb explained the various difficulties and requirements of the scheme. The site occupies practically the same length as the Institute and the main entrances are axial to each other.

The whole scheme is full of intricate detail on account of the many requirements of experimental science, one of the difficulties being the necessity of eliminating all ironwork, which would have a disturbing effect upon the delicate instruments in use. To illustrate the importance of attention to detail, Mr. Webb explained that it was found necessary to make quarter scale elevations of every wall of every room, as well as plans of floor and ceiling, in order to determine and show exactly how and where each pipe and appliance was to be placed.

The accommodation comprises lecture theatre for demonstration work, chemical and physical laboratories, classrooms, galleries in which various instruments will be placed for public inspection, and Professors' quarters, &c. Special provision has been made for the most accurate scientific experimental work of various kinds, and the arrangement of concrete vaulting over these rooms was examined with much interest. After most careful consideration, it was decided to adopt the Plenum system of ventilation and warming, and to a certain extent this seems to have had considerable influence on the plan. Warmed and purified air will be forced in by two sets of 9-ft. fans placed in the basement at each end of a long corridor which runs from end to end of the building, the corridors being made use of for the hot air passages. Inasmuch as the lowest of these in the basement will be under the ground floor corridor, and as the rooms on either side are of considerable height, the upper part of the corridor will on each floor be used for the air duct. These ducts will have hollow walls and will be lined with glazed bricks and paved with tiles, laid and pointed as neatly as possible to minimise dust, and they will be of sufficient height to enable people to walk through and keep them thoroughly clean; light will also be admitted by double windows to areas. Short flues will be formed in the walls from the duct to the various rooms, the flues being built in Fletton bricks neatly pointed. The air is admitted near the ceiling of each room. Provision is made for mixing cold and heated air, to obtain a heat of about 60 deg. on entrance to the rooms.

As the building is only in a very early stage it is not possible to give any description of the general architectural effect, but enough was seen to convince every one that all possible care has been taken to give the scientific workers of the nation a habitation worthy of their work.

It should be noted that the Government have made special arrangements for the supply of the Portland stone which is being used on both of Mr. Aston Webb's great buildings, one quarry being entirely devoted to the work, and every stone being passed by the Government inspector before it leaves the quarry. Great care also is being taken to prevent the discolouration of the face of the stone by Portland cement.

After Mr. Aston Webb had conducted the party over the whole site, explaining and noting interesting things by the way, a move was made to the new museum buildings in Cromwell-road. Here, also, the clerk of works, Mr. Tanner, had arranged a ground plan on a screen, and Mr. Aston Webb explained the general outline to the party. Some alterations have been made from the original competition plan, and though the building has little more than foundation work completed at present, much useful information was gained.

The side-lighted galleries, comprising three floors, facing Cromwell-road, are set out on a curve following the curve of the road, and the difficulties of the angle at the south-west corner are very cleverly got over in consequence. Behind these galleries is placed the great main court, some 700 ft. long, 50 ft. wide, and 50 ft. high, with a semi-circular apse at each end. The ultimate effect of this must be fine. The entrance in the centre to Cromwell-road is surmounted by a tower. The whole of the site is covered with splendid gravel, and when the foundations for this tower were got out it occurred to the architect that it would be well to find out how far this gravel extended. It was found that at one end only 7 ft. of gravel remained between the bottom of the excavation and the London clay. It was, therefore, decided to excavate the remainder, and it was then found that the clay was dipping at a sharp angle, and at the other end of the tower was 30 ft. lower!—a good illustration of the necessity for the utmost care in foundation work. The Plenum system of ventilation will be used, but radiators will be placed in the galleries.

The interior walls will be lined with Cranham bricks and plastered. These bricks give a good fixing for wall exhibits. Externally, brick and Portland stone will be the materials, terra-cotta having fortunately been discarded in favour of the more certain weathering qualities of Portland stone.

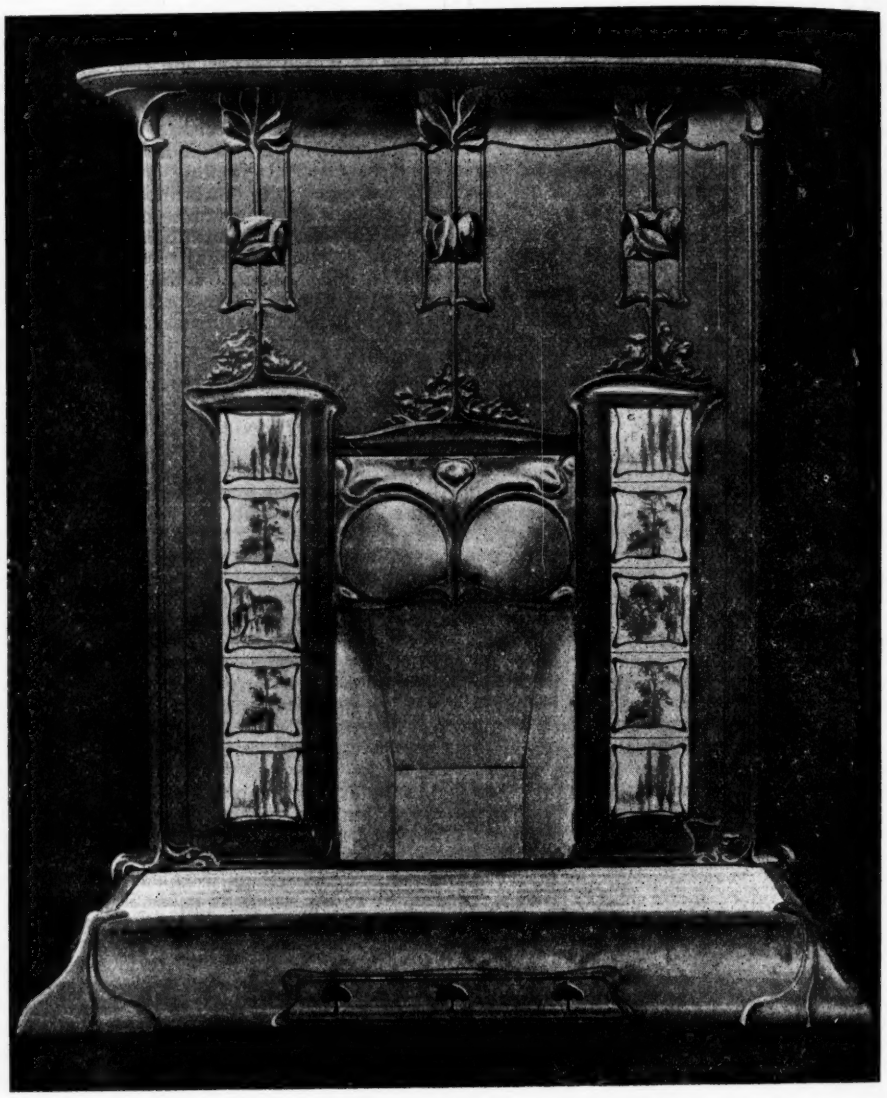
Members of the Association will, no doubt, keenly look forward to the future visit so kindly promised by Mr. Aston Webb. It is scarcely too much to say that the whole building is magnificently planned, and its completion will at last give the country a fitting home for the priceless treasures it possesses, and it is indeed a fortunate thing for the nation that the building of this, the greatest art museum of the Empire, should be in such capable hands.

ARCHÆOLOGY IN LONDON: A PASTIME FOR A BUSY MAN.

UNDER the above title Mr. Edwin Freshfield, LL.D., delivered an interesting lecture at the London Institution, Finsbury-circus, on Monday evening last. Prefacing his remarks by saying that the lecture was founded partly on his own experience, Dr. Freshfield said that when he was about ten years old an extraordinary wave passed over England. It was one of the phases of the great tide in favour of mediæval revival which set in with Sir Walter Scott and found its great triumphs under Sir Gilbert. It was a mania for rubbing monumental brasses. He (the lecturer) came into the whirlpool, and, assisted by his brother, who was older than himself, became with him a very ardent brass rubber. That practically settled the direction of his relaxation for the rest of his life, to be the study of history and antiquity—not that it began and ended in brass rubbing. The earliest monumental brass now remaining in England was in Surrey, at Stoke d'Abernon, near Leatherhead, the date of it being 1277. The latest would be difficult to fix, but it would be safe to put it about 1650. So that these two monuments covered a space of, roughly, 400 years. The main collection of brasses in London were in the churches of St. Helen's, Bishopsgate, and All Hallows, Barking, but there were others in several of the churches not destroyed at the fire, and together they formed a representative collection of smaller brasses of the fifteenth century and onwards, consisting of priests, knights, citizens, and ladies. By far the most interesting were in Westminster Abbey. He recommended to the attention of his hearers interest in monumental brasses, for in preserving them they were preserving valuable history. The visiting of churches for the sake of rubbing brasses naturally led, said the lecturer, to the visiting of the churches for themselves, and he would like to say a few words as to how an antiquary might, without going out of the limits of a two-shilling cab fare from the Bank, see examples of a great many of the various styles of architecture prevalent in England. Dealing first with the Roman period, there were, he said, some remains of Roman architecture, mainly in the city walls. Whenever those were excavated to a sufficient depth, and that was from time to time happening, the original wall with the Roman construction of stones with bands of brick was found. The last and almost perfect specimen which was uncovered was near the Money Order Department of the Post Office, close by the Church of St. Botolph Without, Aldersgate, but from time to time other portions were uncovered. He believed that the portion at Aldersgate was preserved—he knew a promise was given that it should be so—but the process of uncovering occurred from time to time, and an antiquary might reasonably hope to see a portion of the wall uncovered to the bottom. There were portions of it still visible above: a considerable portion in the churchyard of St. Giles, Cripplegate, a small portion in the churchyard of S. Alphage, and another portion near All Hallows in the Wall. There was a great deal more when he first began. Pavements were constantly being discovered, and an antiquary ought always to mark the site. Of Saxon architecture there still remained some portions of old buildings of the Confessor at Westminster. One of those buildings, about which, however, he believed some doubt had recently been raised, was the chapel of the Pyx. That building was not easy to be visited; it required a special order from the Chief Commissioner of Works, which in former days was not readily granted, though the fact that the chapel was no longer used for the special purpose for which it was employed, viz., a sort of treasure house, ought to render the possibility of visiting it more easy. The next building in order of date was undoubtedly Norman. It was the chapel in the Tower. That was the most perfect specimen of very early Norman work, not only in London, but, he should think

anywhere in England. It had never yet been touched, it had never been restored, and they would have to go to Normandy itself to find a building exactly like it. It consisted of a nave with an aisle, with a semi-circular apse at the end. The capitals of the pillars, too, pointed to a very early date. The next building in order of date was the crypt under Bow church, also in part Norman. That crypt was always accounted to be Norman, but there were some peculiarities about the walls which made him think that it was partly Saxon, or perhaps Saxon built with Roman bricks. Anyhow, it was a very fine specimen of early work, and as it had always been treated as Norman, it might be treated as such. There was a peculiarity about the crypt in that it was square at the east end. A fragment of another building might be seen which also fell before the end of the eleventh century, viz., a portion of the outer west wall of Westminster Hall. That building was built by King Rufus. The hall was practically rebuilt in the time of King Richard II., but a large portion of the old wall was left and still remained; and when the law courts, which abutted on the side, were being pulled down about twenty years ago, the Norman work was plainly visible. It was easily distinguished from the later work by the difference of the colour of the stone and the tooling, and by the fact that all the Norman work was covered with the masons' marks of the period. The next building, which fell into the next century, was also Norman—the Priory Church, now the parish church of St. Bartholomew the Great. That, like the church in the Tower of London, ended with an apse. That building showed an advance in decoration on the work in the chapel in the Tower, but there was a strong similarity between the general features and the arrangement of the two buildings. The next three buildings which fell into that century were the round part of the Temple church and crypt, and a small portion, which remained, of the round church of the Knights of St. John of Jerusalem in Clerkenwell, and the church of St. Saviour, Southwark. The Temple church that we now knew was called in the old records the new Temple. The old Temple was situated in Southampton-buildings, near to the Holborn end of Chancery-lane. Some years ago, when the houses between Southampton-buildings and Chancery-lane were pulled down, the foundations of the old church, a round church, were visible. The Temple was removed from Southampton-buildings to the present site, and the new church consecrated, in the year 1185 in the reign of King Henry II. It was quite clear from an examination of the buildings of the Knights of St. John of Jerusalem at Clerkenwell, that there was an earlier church there also. The existence of a round church was never suspected until two years ago, when the present rector, Mr. Woods, with the energetic churchwarden, Mr. Fincham, on clearing away the western end of the crypt for the purpose of making an entrance, discovered sufficient of the remains of the round church to be able clearly to identify it and its size. From the manner in which this round church was applied to the crypt, it was quite clear that that was an addition, and that as in the Temple Church, so in the Church of St. John at Clerkenwell, there was an old church to which the newer round church was added. As a fact, both the Temple and the Church of St. John were consecrated in the same year by the same prelate, Heraclius, Patriarch of Jerusalem, and therefore the date could be accurately fixed. In passing, it was worth remarking that the Angevine stonework of the building of the Hospitallers was covered with masons' marks, in the same way as the wall of Westminster Hall, to which he had referred. The next building, which he took to be only slightly later in date, was the Church of St. Saviour, Southwark—St. Mary Overy. The chancel of that church formed a very beautiful specimen of what was called Transition Norman, but which he had called Angevine architecture, and about that church there was a very interesting feature. There was a very peculiar ornament of a leaf description round the arcade of the church. A similar ornament might be seen at New Shoreham Church, in Sussex, at Reigate, in Surrey, and there were features which, he thought, showed that those three, together with the church at Carshalton, were all built by the same architect. If one drew a line from Shoreham to Southwark, they would find that it passed nearly straight through those two towns. It seemed to him not a monstrous suggestion that the same gang of builders were employed in the four churches, and that they went straight from Shoreham to London. But there was something still more interesting about this ornament—he did not know any other place in England where it was to be found, but it was very common in the East, and might be found as a decoration in the group of churches built in the neighbourhood of Antioch round the great church of St. Symeon Stylites. Coming to the reign of Henry III. in the thirteenth century, Mr. Freshfield referred in detail to the beautiful three-aisled church of the Templars, which was added on to the round church of Henry II.'s reign, and to the still more beautiful building, the Chapter House at Westminster Abbey. This latter building should be compared with the Temple Church, and the extraordinary advance in architecture between those two dates—1185 and 1250—was especially remarkable. Westminster Abbey, which was in some respects by far the most interesting building, not only in London, but in England, was rebuilt in the reign of Henry III. It was not built by an English architect, the arrangement was entirely French, and the design was no doubt French, but that did not prevent the church being a perfect storehouse of the most beautiful details of Gothic architecture; and the Abbey alone, if there was no other building in London, would itself almost provide examples of every style. Coming to the reign of Edward I., the lecturer said that the most magnificent specimen of architecture of that period—the old east end of St. Paul's—was unfortunately destroyed at the fire. There was one small, but beautiful specimen of this style, a church now, alas, lost to us—the Chapel of Ely House, in Ely-place, supposed to be built by Prior Crawden. Considerable portions of the Tower of London were built at this time, and notably Traitor's Gate, which was an arch without a keystone built in a style very common in the East, where it was used to provide against destruction by earthquake, but not so common in England. The succeeding style, which they called the Perpendicular, commencing with the reign of Richard II. and ending with that of Richard III., had the largest number of ecclesiastical and civil buildings. The nave of Westminster Abbey was a remarkable instance of a Perpendicular building made to accommodate itself to the earlier French style. Westminster Hall was a beautiful specimen of domestic architecture; the Guildhall, and most of the churches in the City which escaped the fire, were also examples of this style. He thought he had said enough to show that in the realm of architecture the citizen who took up antiquities as a study would have no difficulty in finding interest and employment. Having referred to the architectural features of the principal City churches, the lecturer gave some most interesting historical particulars of London life which he had gathered from the parochial records of the City of London. In concluding, Dr. Freshfield commended antiquarian studies, particularly to a quiet contemplative man, who, he said, could get abundant employment therefrom. They were interesting in themselves and were a species of continual education. The longer one studied, the more one found to learn. For an antiquary must be thorough, and of all things seek for the truth. They might never make a great discovery—that was given to few; but they might always be recording facts which would fall into their places in the general history of the world. Nothing that an antiquary did was ever lost.

The lecture was illustrated with lantern slides.



Design for a Fireplace. By Mr. A. Harold Smith.

DESIGN FOR A FIREPLACE.

THE above design for a fireplace is produced in cast-iron, with ornament in low relief, and has been designed and modelled by A. Harold Smith for the Teale Fireplace Co. The panels at the sides are arranged to admit five 6-in. tiles treated in a style to suit the whole design. The hearth is partly fireclay, with a tiled surface,

and is surrounded by an iron fender 6½ in. high; this height is rendered necessary in order that the hearth may form a front for the fire, which is sunk 3 in. below its level and burns in a grate beneath which is an ashpan, easily removable through the front of the fender for taking away the ashes whilst the fire is still alight. A. HAROLD SMITH.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Battersea Borough Council 6,200*l.* for electric-light installation and meters; Stepney Borough Council, 678*l.* for street improvement; Woolwich Borough Council, 6,000*l.* for purchase of electric-light undertaking; Poplar Borough Council, 720*l.* for underground convenience; and Shoreditch Borough Council, 20,000*l.* for electric-light installation.

The Works Department.—The same Committee submitted the following report:—

"The Council has before it a report from the General Purposes Committee recommending certain changes in the arrangements for the control of the Works Department. The financial control of that department has been delegated by us to a standing sub-committee. The sub-committee have informed us that their experience leads them to the opinion that the best method by which the Council could execute its own works would be to place the responsibility for the execution of those works in the hands of either the Architect or the Engineer, according to the nature of the work to be executed. The sub-committee have been in existence for nearly five years, and considering the experience which they have gained during that period we think it our duty to lay before the Council the opinion at which they have arrived.

A long debate then took place on the following recommendations of the General Purposes Committee:—

"(*a*) That an advertisement be issued inviting applications for the appointment of Manager of Works, and that the salary to be attached to the position be 1,500*l.* a year, as at present.

(*b*) That a standing Committee, consisting of seven members, be appointed for the supervision of the Works Department, and that such committee be styled the Works Committee."

Sir John Dickson-Poynder, M.P., moved, as an amendment: "That the Works Department should only be continued for the purpose of completing the works in hand, and no new constructive works be undertaken, and accordingly that it be referred to the General Purposes Committee to report fully as to the appointment of a temporary manager." He said the Report before them was characteristically meagre in dealing with so important a subject. He presumed that the recommendations implied that the Works Department was to be maintained in its entirety in the future. His proposal was that a Works Manager should be employed temporarily. He wanted to make it quite clear that he did not wish to interfere with the proper carrying out of the duties of the Works Manager as long as there was outstanding work to be done. If he had his own way, so grave did he consider the matter, and so unsatisfactory had it proved, that he would wind up the Department to-morrow. But, of course, that Department had developed, and was a large undertaking, and could not be wound up in a day. Besides that, nearly 750,000*l.* worth of work was now being carried out by the Department, and he proposed that they should all co-operate together to carry out that work on the clear understanding that no new work should be placed with the Department. He contended that such a winding-up could be carried out without abnormal expense, and certainly the cost would pale in comparison with the expense of continuing the Department. He was opposed to placing the work under the Architect and Engineer, as some members proposed, because the appointment of a Manager was the only check over the Works Department. Three points were advanced by those who advocated the system of direct labour of this kind; (1) it prevented a ring of contractors artificially putting up prices; (2) that the maintenance of the Department prevented the undue pressure of labour under the contract system, and (3) that the Council should have such a department so as to secure to the ratepayers the contractors' profits. As to the ring of contractors, there was no evidence of anything of the kind ever having taken place among the contractors employed by the Council. But even if it had been possible for the London builders to combine for such a purpose, there was nothing to stop the Council going to builders outside the county—anywhere in the country, in fact. It seemed folly to say a ring had been formed when there was such a large open market. As to undue pressure on labour under the contract system, that could not honestly be said in view of the conditions of contract in force under the Council, those conditions being extremely rigid. He strongly contended that the contract system could not be said to encourage undue pressure on labour. The third argument was purely theoretical, and it was unnecessary for him to argue against it as a profit had never been made by the Department. The Council's whole experience showed that contracting was satisfactory and direct employment a failure. In the last five years the Department had carried out 700,000*l.* worth of work for the Housing Committee, and the excess over the measured value and the detailed prices of the officers was no less than 65,000*l.* But the officers' prices were based on the fact that there would be a profit to the contractor, so that not only did they lose the theoretical profit, but they lost 65,000*l.* which was irrecoverable. On the other hand, contractors had carried out 187,000*l.* worth of work for the same Committee, and the saving on the officers' estimates, based on the quantities and detailed measurements, was over 15,000*l.* They would be told that there had been bad management, but they had always made a failure, and he considered they had enough experience now to make it perfectly clear that the contract system was the best. With regard to the Labour members, of course one of their functions was to safeguard the interests of the workpeople and the Trades Unions. There was a vague idea running through the Trades Unions that the conditions under which they worked for the Works Department were preferable to those under the contract system. The Labour party were not there to be led by the Trades Unions, but they should lead the Trades Unions, and he asked them to acknowledge that they had so far backed the wrong horse, and that in the interests of London it would be better to revert to the contract system. He was convinced that a gigantic labour bureau controlled by a Municipality was impossible.

Mr. Beachcroft seconded the amendment. He did not intend to "pile up the agony" by further exposing the failures of the Works Department, but he would point out that the Department had been no happier in dealing with engineering than with building works. The Council had now come to the meeting of the ways, when they must either mend or end the Department. He did not think that making the architect or engineer responsible would be a success, because that would leave the Council without any direct check. The alternative was the re-appointment of the Works Committee, who were to be the directors of this gigantic municipal enterprise. He predicted that they would again fail, as they had failed in the past, because they had no inducement of gain before them, such as railway and other directors had always in view. He was driven to the conclusion that in the interests of the ratepayers the Council should at once cut the loss. Were the Council to carry on this huge business at a continual loss, merely for the sake of the privilege of employing 2,000 out of the 200,000 workmen and labourers employed in the building trade of London? Advisedly, he said "No." The Council should recognise that discretion was the better part of valour, and should give up the impracticable experiment of the Works Department. It could not be said that the Department had been starved. In 1898-99 the value of the work undertaken by the Department was 216,000*l.*; in 1899-1900 it was 164,000*l.*; in the next year it was 344,000*l.*; and in the first half of the past year it was 147,000*l.*

Earl Carrington thought there must always be a danger of contractors forming a ring against the Council. The remount and meat scandals showed the necessity of a Works Department in connexion with the Government, and he believed that the Council, with a reconstituted Works Department, would be able to show a saving and a secure service. He defended the principle of the direct employment of labour, believing it to be in the best interests of those whom the Council represented.

Sir Arthur Arnold thought that the past five years' management of the Department under the Finance Committee was a huge mistake. With regard to Sir John Dickson-Poynder's statement that there had been a loss of 65,000*l.*, he denied that there was any foundation for it. They had always given four or five times more work to contractors, and until they could compare the accepted tenders of the contractors with the officers' prices they could not say there had been a loss. He believed the Department had a useful future before it, and he asked for one more trial for it under a Committee.

Mr. A. T. Williams remarked that the Department had failed with architectural work and with engineering work, and now they heard that jobbing work could be done at a considerably lower price than at present. Therefore, he considered there was no case for further trial.

Mr. Bruce said he could see no reason why the Works Department under a new Committee and with a new Manager, and aided by experts in architectural and engineering works, should not prove successful.

Lord Welby, Chairman of the Finance Committee, pointed out that in regard to estimated works executed by the Works Department during the past four and a half years, the total amount given to the Department was 466,000*l.*, calculated on the final estimates. Those works actually cost 473,000*l.*, or an excess of 7,000*l.*, but it should be mentioned that if they removed from the total the North Woolwich drainage, upon which there was an excess of 16,000*l.*, there would have been a saving of 9,000*l.* If they added to the totals the jobbing works carried out during the same period, they found that the total estimates came to 601,950*l.*, and the actual cost to 602,327*l.* That only showed an excess of 377*l.*, or 8d. in every 100*l.* That was a result of which they need not be ashamed, and before taking the serious step of abolishing the Department, the Council should pause and consider whether, after all, the Department had not something to say for itself.

Mr. Cohen supported the amendment. Their experience of the Works Department had been not only unfortunate, but almost disastrous.

Mr. M'Dougall said it was very difficult to discover whether the Council were losing by the Works Department. His opinion was that the Council had gained immensely by it. The improvement in the work done by contractors for the Council during the past ten years was due to the creation of the Works Department.

The amendment having been defeated by a large majority,

An amendment by Mr. Sears, to appoint an Advisory Committee to consider the question of the reorganisation of the Works Department prior to the appointment of a new Works Manager, was moved and lost.

Mr. E. White proposed a further amendment to substitute 1,000*l.* for 1,500*l.* He remarked that the Department was overcapitalised, and, whoever was appointed, the losses would continue. He believed that that day the Department was going to embark on a third and final stage.

Mr. Steadman seconded the amendment. The Department was overburdened with expense, and it was quite possible to get a good manager for 1,000*l.*

Mr. Dickinson said it was necessary to pay a good salary to get a good man. There was no doubt that the failure of the department had been largely a personal one, for, unless it was felt that the post was a permanent one, the best men would not apply.

On a division, the amendment was defeated by 73 votes to 41.

The Council then divided on recommendation "*a*," which was carried by 76 votes to 39.

Mr. W. Peel moved on recommendation "*b*" an amendment to refer it back for further consideration.

Mr. Sidney Low, in seconding the amendment, remarked that the leaders of the Progressive party ought to have given them some little more explanation of what they were proposing, and the main reason why he supported the amendment was because no explanation had been forthcoming for their remarkable change of policy. Up to that afternoon they had been given to understand that the Works Department was regarded as a great success, and it was only that afternoon

they hea d to the contrary when his friends developed their attack.

The amendment was defeated, and the recommendation was carried by 82 votes to 26.

The Architect's Department.—The Establishments Committee recommended and it was agreed—

"(*a*) That authority be given for the retention for a further period of six months of the services of the ten assistants on the unestablished staff whose services were authorised on December 10, 1901, and for the employment of additional assistants on the unestablished staff in the general constructional section of architect's department at a total expenditure, including the pay of the ten assistants referred to, of not exceeding 100*l.* a week.

(*b*) That authority be given for the expenditure of a sum not exceeding 450*l.* for providing tables, fittings, cost of removal, and provision of artificial light, in some of the rooms at 19, Charing Cross-road, in connexion with the employment of the staff referred to above."

Strand Widening and New Street from Holborn to Strand.—The Improvements Committee reported as follows :—

"In connexion with the Strand Improvement, authorised by the London County Council (Improvements) Act, 1897, and the Holborn to the Strand improvement sanctioned by the London County Council (Improvements) Act, 1899, considerable progress has been made, and we desire to report as to the extent of the work already completed.

As soon as the Acts in question were obtained, we served notices to treat in respect of the property in the Strand needed for the improvements, and commenced negotiations with the owners with a view to the acquisition of the land. Every effort has been made to expedite the improvements, and the Council is now in possession of practically the whole of the property between Catherine-street and the Law Courts on the Strand frontage, as well as the whole of the land between Holywell-street and the Strand. Nearly all the houses have been demolished, and considerable progress has been made with the sewer, subway, and paving works.

During the acquisition of the property, we gave much consideration to the important question of the arcitectural features connected with the improvement, and we consulted the Royal Institute of British Architects in the matter. The Council, upon our recommendation, obtained from eight selected architects suggested designs for the elevations of the buildings proposed to be erected fronting on the Strand and on the crescent road to be formed between Wellington-street and Clement's Inn.

It will be within the recollection of the Council that the Act of 1899, which authorises the construction of the new street from Holborn to the Strand and the widening of the Strand east of Wellington-street, makes provision for the reinstatement of the Gaiety Theatre, Gaiety Restaurant, and Messrs. Shorts, Limited, at the western end of the site which will be formed between the new crescent road and the Strand, and the Council has given its approval to a design by Mr. Ernest Runtz, based upon Mr. Norman Shaw's sketch design, for the elevation of the new theatre and restaurant, proposed to be erected on the site in question, and the company have made much progress with the foundation work for the new buildings.

The Act of 1899 also makes provision for the reinstatement of Carr's restaurant on the north-eastern frontage of the proposed crescent road close to the Law Courts, and the Council has approved an elevation for the new restaurant.

The work of forming the new street from Holborn to the Strand and clearing the insanitary area at Clare Market is being undertaken as one scheme. In the Clare Market area about 3,038 persons of the working class were displaced, and the scheme sanctioned by the Home Office was that accommodation should be provided for 750 persons on the cleared land at Clare Market, and for 1,500 persons at Millbank. For the new street about 3,700 persons of the working class will be displaced, and the scheme sanctioned by the Home Office is that accommodation shall be provided as follows: 250 on the Duke's-court and Marquis-court sites, 709 in a lodging-house in Drury-lane, 1,681 on the Reid's Brewery site, 680 on the Herbrand-street site, and 290 at Millbank.

In carrying out the complete scheme of improvement it will be necessary to acquire in all forty-nine licensed houses, and the Council has decided to continue the policy hitherto maintained, and to abandon these licences.

The work of widening the Strand has involved the acquisition of portions of the churchyards of St. Mary-le-Strand and St. Clement Danes. The Act requires the Council to undertake the removal and reinterment of all human remains which may be found in the parts of the churchyards required for the improvement. The Council accordingly made arrangements for the removal of the remains and their reinterment in the consecrated portion of Brookwood Cemetery.

The work of excavation for the sewer in the Strand and the work of constructing the sewer has been almost completed, and more than half of the subway for pipes, wires, &c., has been formed. The paving work is well in hand, and it is expected that all the work connected with the widening of the Strand will be completed in May next, and we hope in the course of a few months to be able to form the new crescent road which will commence at Catherine-street and will re-enter the Strand close to St. Clement Danes Church."

The Council adjourned shortly before eight o'clock.

Illustrations.

ADDITIONS TO BROCKLESBY PARK.

THE eastern block of Brocklesby Park, the seat of the Earl of Yarborough, was completely gutted by fire in the spring of 1898. The old walls were very irregular on face, and all of them were battened, the battens being fixed to wood plugs built in, the result of which was that the space between plaster and walls acted as a flue, and it was impossible in consequence to master the flames.

The part of the house burnt dated from the early part of the eighteenth century, and built in to the walls were fragments of a sixteenth-century house; but the arrangements of the old place were very inconvenient, and on rebuilding the plan was completely rearranged, only the old dining-room and staircases occupying the original position. A new drawing-room, 70 ft. long, was formed along the south side, and a new hall formed in place of the old drawing-room, with a new vestibule and front entrance, and the whole of the eastern block of the house was rebuilt.

The materials are small red bricks and Ancaster stone. In the vestibule the columns are monoliths of green Cippolino with statuary caps and bases, the paving being of Cippolino and Piastriaccia marble.

The general contractor for the works was Mr. J. A. Hunt, of Hoddesdon. The ceilings were executed by Messrs. G. Jackson & Son, the wood-carving by Mr. Bessant, and the stone-carving by Mr. Aumonier from the architect's drawings.

New terraced gardens on the east and south sides are now being formed from the architect's designs. The architect is Mr. Reginald Blomfield, of London.

HEARTS OF OAK SOCIETY'S OFFICES COMPETITION.

WE give the elevations and plans of the design, by Messrs. Essex, Nicol, & Goodman, of Birmingham, which obtained the first premium in the recent competition for new offices for the Hearts of Oak Benefit Society.

The design was described and commented on at some length in the review of the competition designs in our issue of January 11. We, however, applied to the architects for any further and more detailed description they might wish to give, but they have unfortunately referred us to the Report accompanying their design, which is not, of course, in our hands.

DESIGN FOR A LECTERN.

THIS design, by Miss S. Thompson, is one which obtained a silver medal at the last International Art Competition at South Kensington.

The whole work stands 5 ft. 2 in. high to the highest point, and is intended for cast bronze, but might be carried out in any other metal.

We give the general elevation of the front view, and larger drawings of some of the details.

COMPETITIONS.

OFFICES, DARTMOUTH.—The first premiated design in the competition for offices and dwelling-house, for the Channel Coaling Co., Dartmouth, was sent in by Mr. A. S. Parker, Plymouth. The second premiated design was by Mr. J. J. Smith, Bideford; and the third by Mr. P. Kerley, Exeter.

BAPTIST CHURCH AND SCHOOLS, SOUTH BANK, YORKSHIRE.—The designs submitted by Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines have been accepted for this scheme. The accommodation provided in the church is for 542 adults. The estimated cost is 4,380*l.*

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS.—At the ordinary meeting on the 13th inst. Mr. Charles Hadfield read a paper entitled "Notes on some South Yorkshire Churches." He said that his object in noticing the neighbouring South Yorkshire churches was to illustrate from their mode of plan and construction the state of technical education as regards building matters in England while the national architecture flourished. Mr. Hadfield proceeded to notice the following parish churches :—Rotherham, Treeton, Handsworth, Aston, Ecclesfield, Sheffield, and Laughton-en-le-Morthen, giving outlines of their history from Domesday and other sources, and describing by aid of plans which he had prepared the date and mode of their construction. The surveys of most of them were prepared during works of repair done by himself during the past thirty-five years. The influence exercised upon the art of the district by the great Archbishop Scott, or Rotherham, a native of either Rotherham or Ecclesfield, was pointed out, and allusion was made to his college at Rotherham and his work in rebuilding the church there.

BRISTOL SOCIETY OF ARCHITECTS.—The ordinary monthly meeting of this Society was held at the Fine Arts Academy, Queen's-road, on the 10th inst., Mr. Frank W. Wills (president) in the chair. After the routine business, a paper was read by Mr. Alfred H. Dykes, Assoc.M.Inst.C.E., M.I.E.E., on "Electricity as Applied to Buildings." The lecturer in his opening remarks said the field covered by the title was a very wide one, but he proposed to confine himself principally to the consideration of the alterations in the design of factories and works necessitated by the growing use of electrical energy and methods of distributing the current inside buildings. When electrical power was used in a works the various machines could be disposed exactly where found most convenient, without any regard having to be paid to the question of shafting. The whole building could be made lighter, and in the case of large works a central power-house with one or two large economical engines, and a battery of boilers equipped with mechanical coal and ash-handling plant, would take the place of a large number of scattered engines and boilers each requiring separate attention. Examples were given of two different classes of installations, the first a printing works, and the second a group of large mills, and it was pointed out that the electric method was the more economical in both cases, although the conditions were entirely different. In the first case the various machines were continuously being started and stopped, and the use of separate motors enabled any press to be run at any time without long lines of counter shafting having to be kept in motion, whereas in the second case the demand for power was constant, and the economy effected was due to the ability to use one concentrated power station with few units, thus securing the most economical engines and greatly diminished wages bill. Where space was limited it was possible, by using electrical driving, to dispense with the room otherwise required for engine and boiler houses and take current from a station somewhere outside the works, a good instance of this being furnished on the Tyne, where Messrs. Armstrong, Whitworth, Wigham Richardson, and other shipbuilders, being cramped for room, had thrown out their own engines and boilers and were now supplied with power from a public power supply company. After entering into a short explanation of electrical terms, the author next proceeded to trace the various methods which had been employed for distributing current inside buildings. Until recently vulcanised rubber was practically the only material used for covering wires conveying the current, and in dry situations it gave very little trouble. It could not, however, be relied on for use where it would be alternately wet and dry. The use of wires, insulated with paper and lead covered, and also with vulcanised bitumen, was touched upon. Wooden casing as a protection for the wires was fast being superseded by simplex tubing, screwed iron barrel, or brass tubes. Attention was drawn to the advantages of "concentric wiring," in which only the inner conductor was insulated, and the author described a modification introduced by himself, combining the advantages of the flexible concentric system with the ability to replace any faulty or

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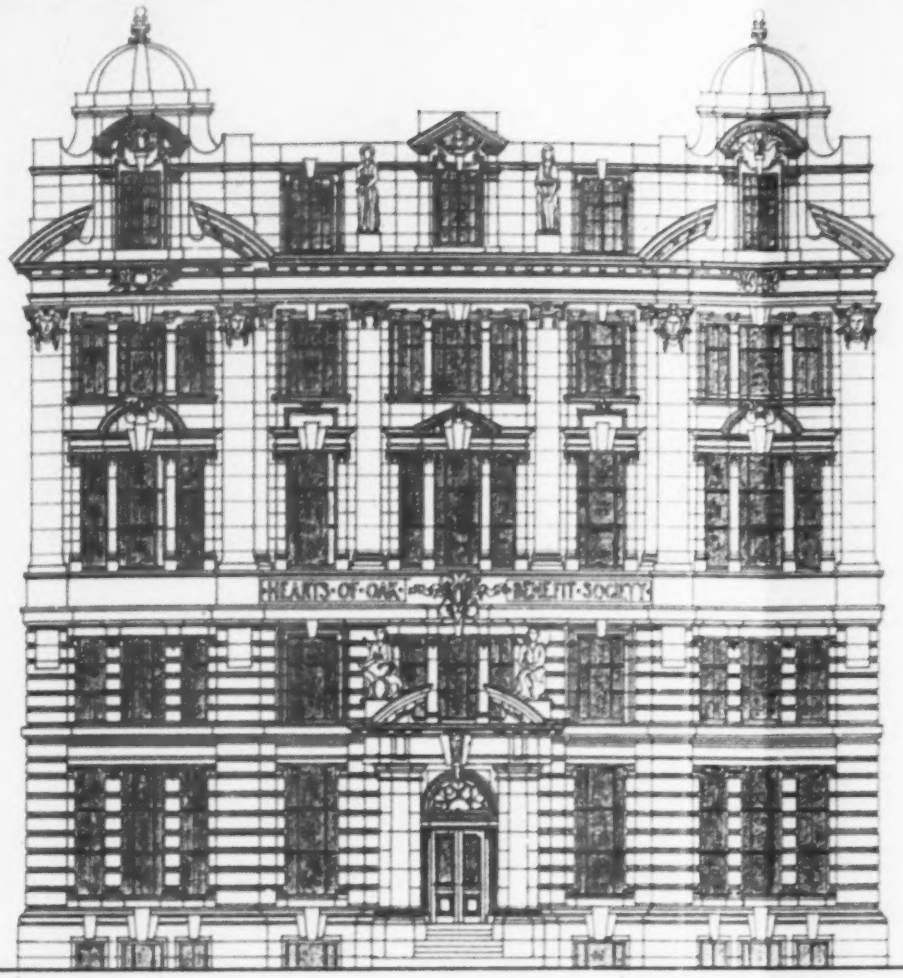

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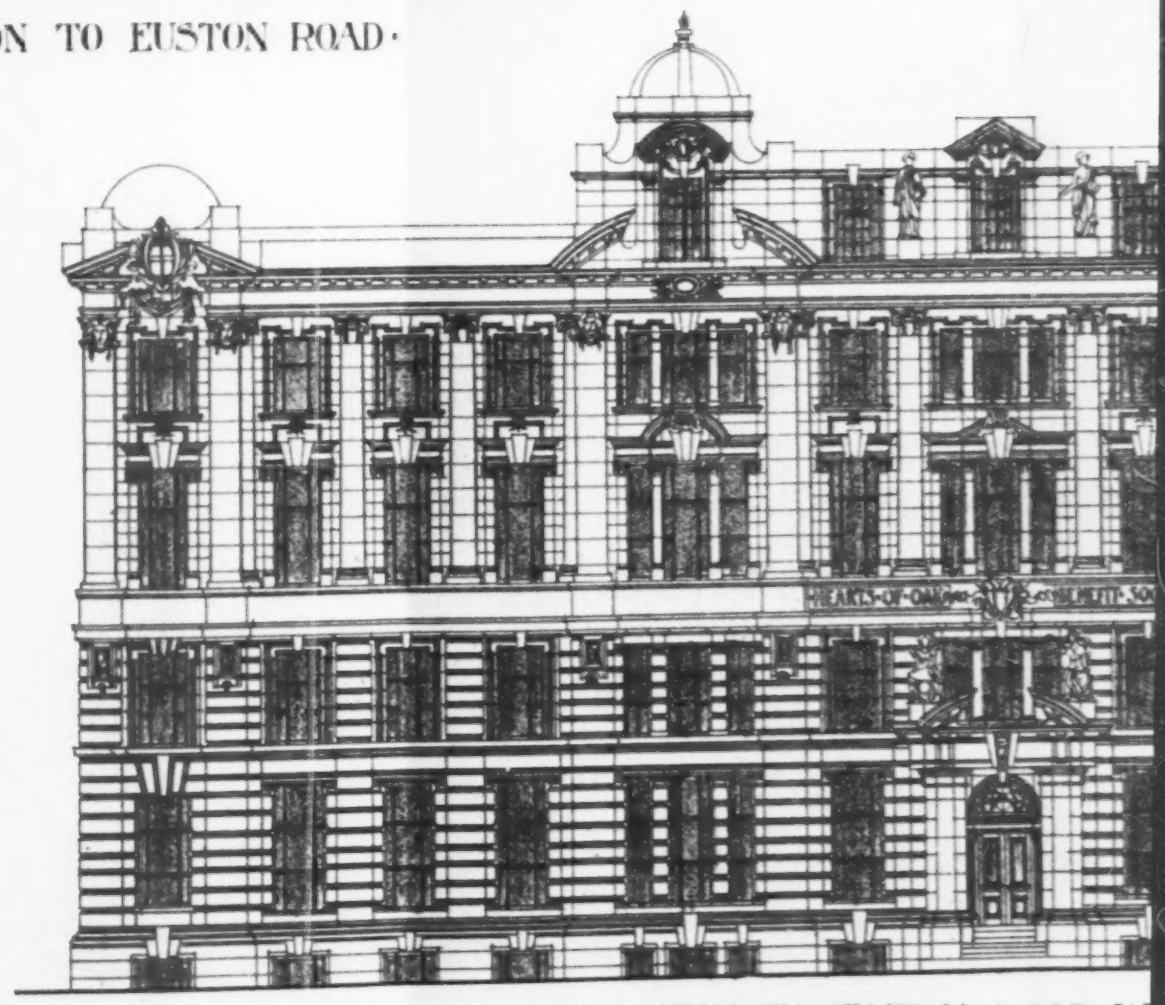

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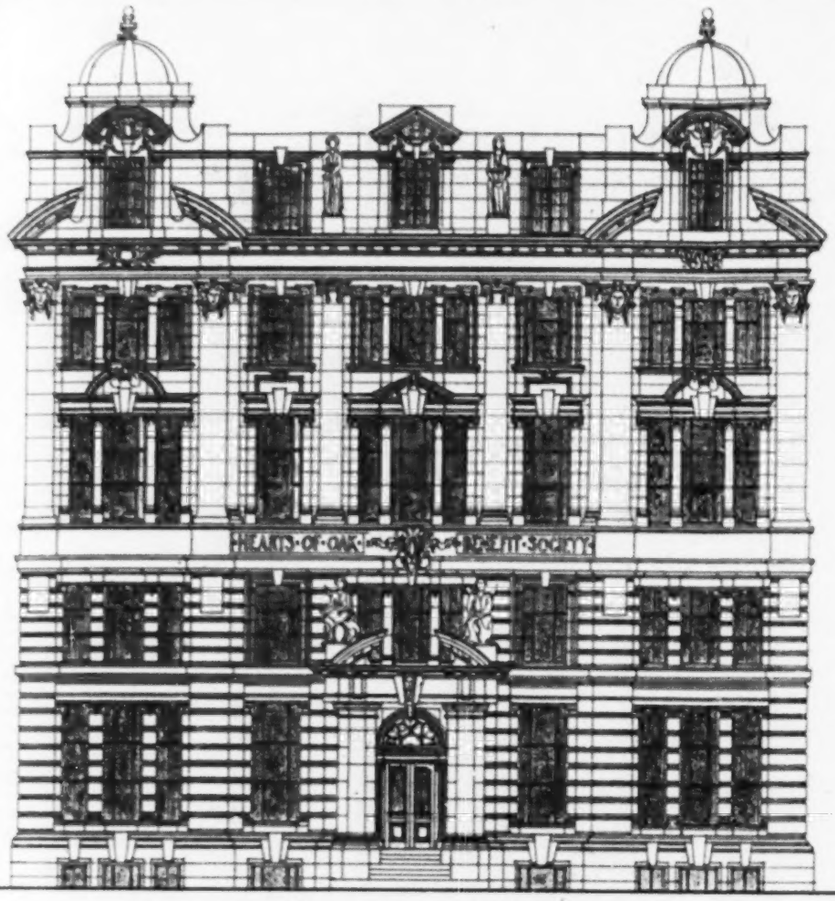

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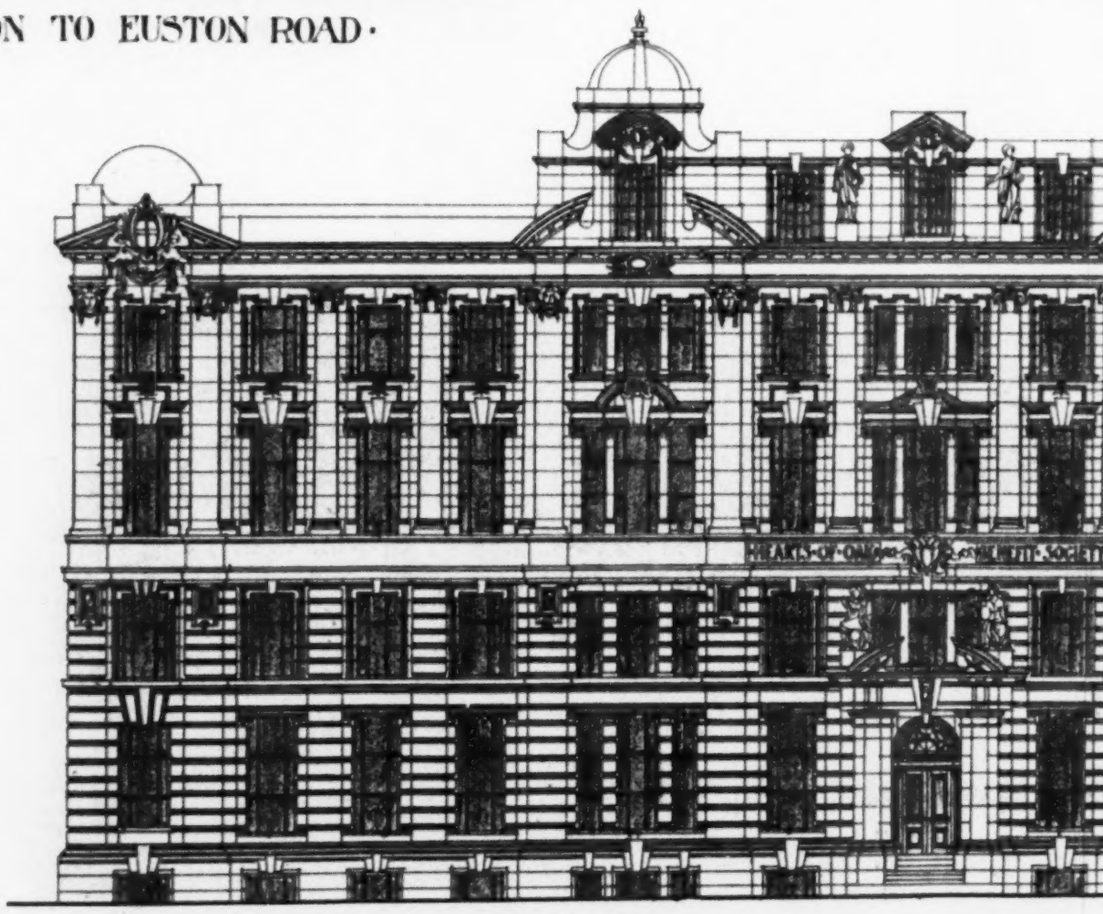

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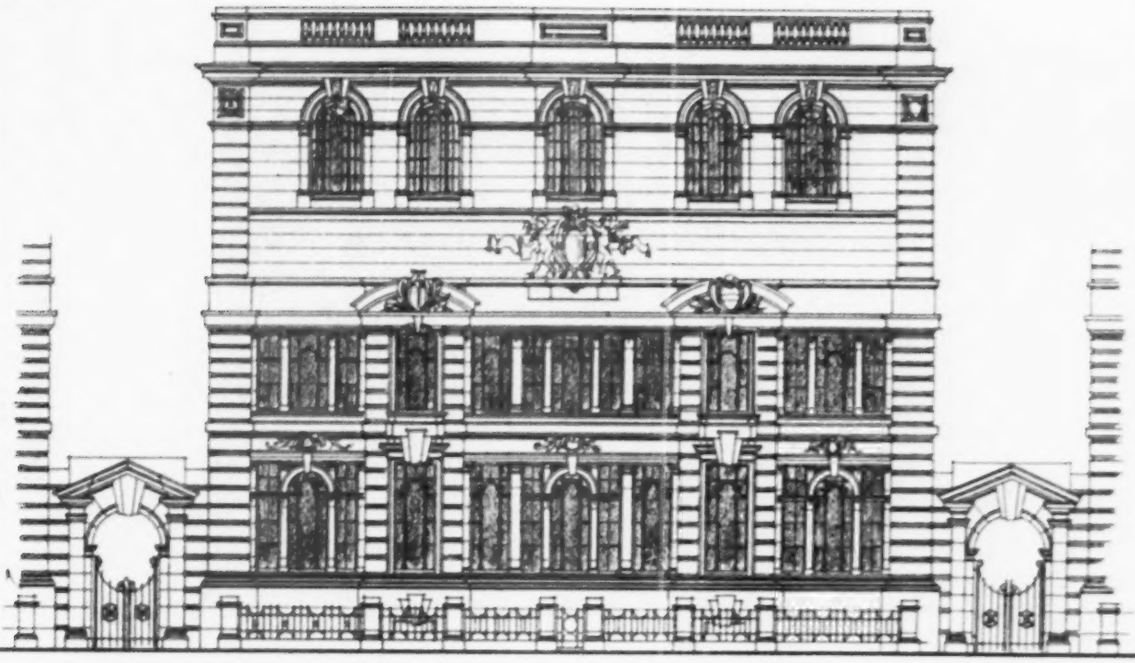

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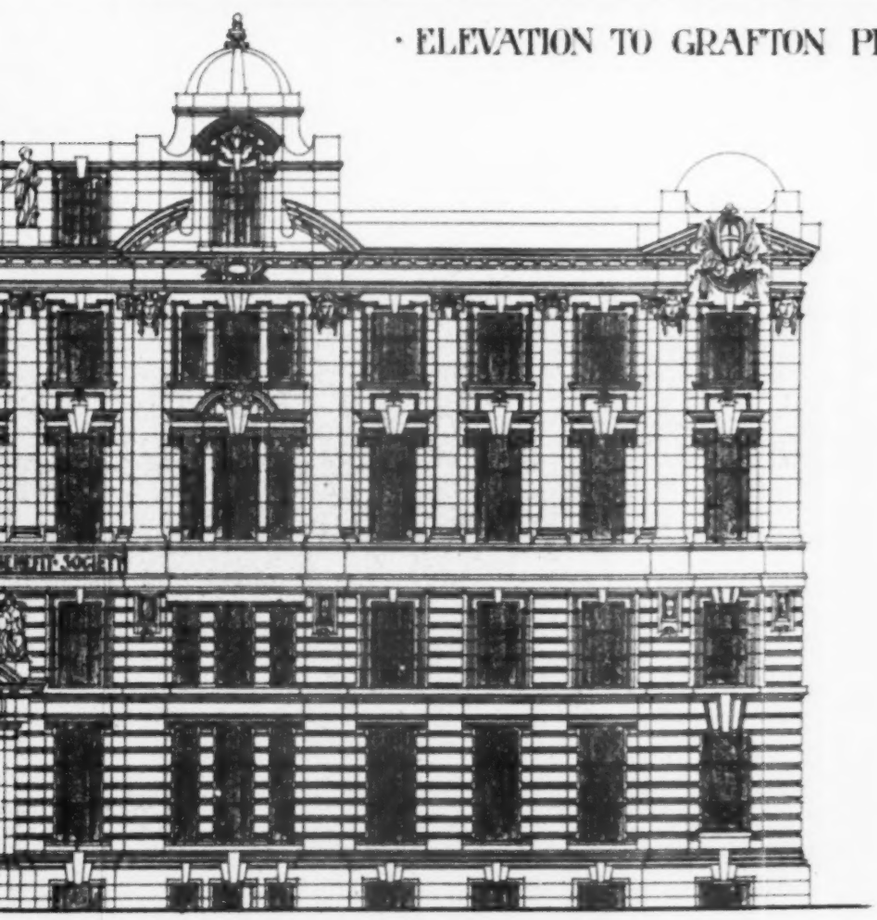

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DESIGN.—MESSRS. ESSEX, NICOL & GOODMAN, ARCHITECTS.

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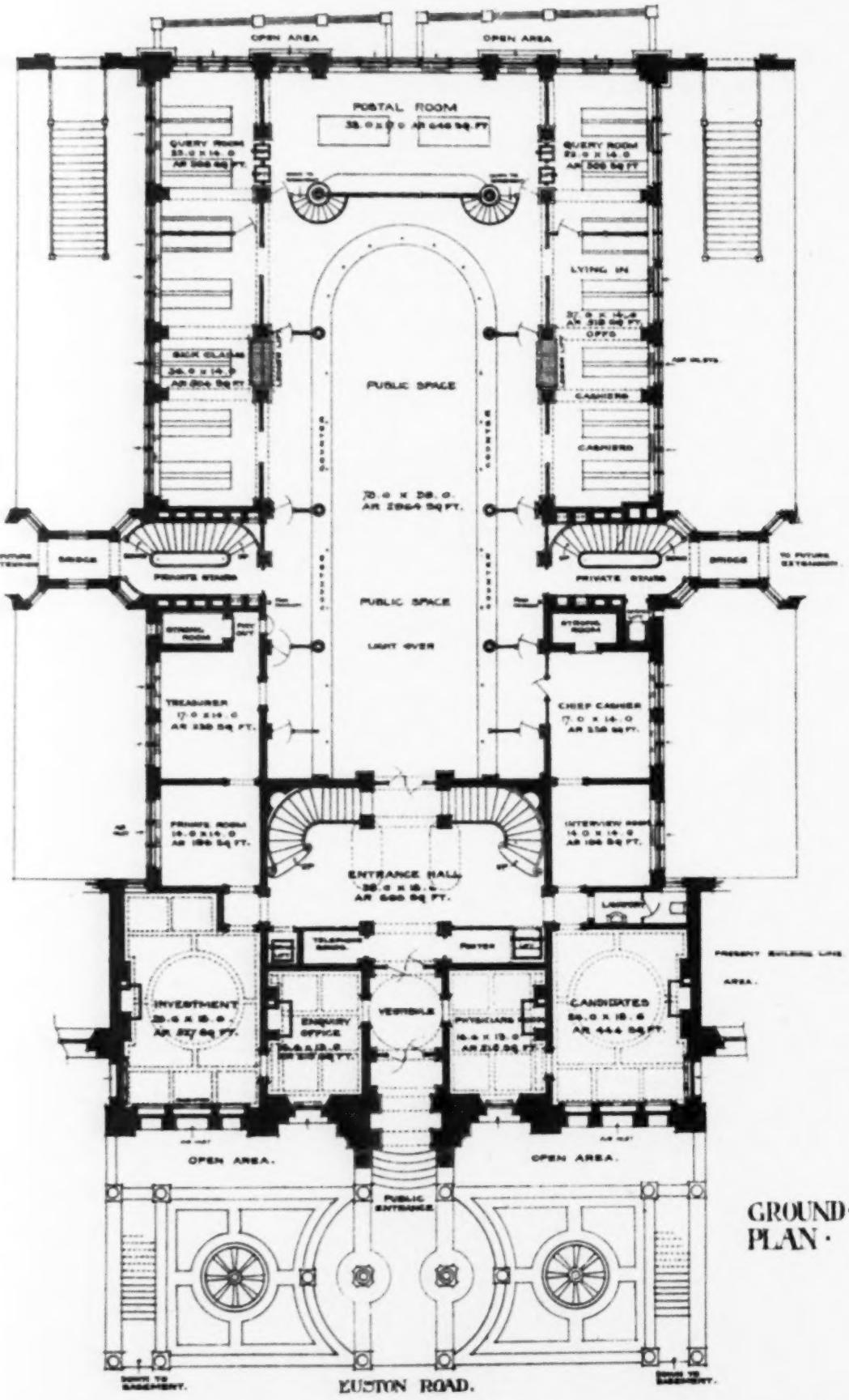

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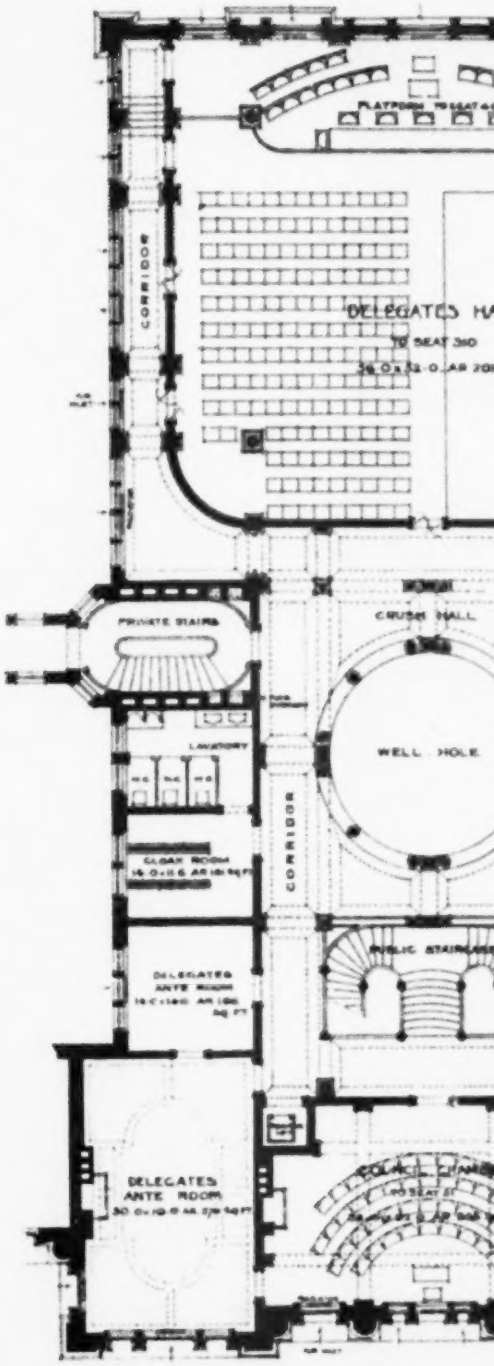

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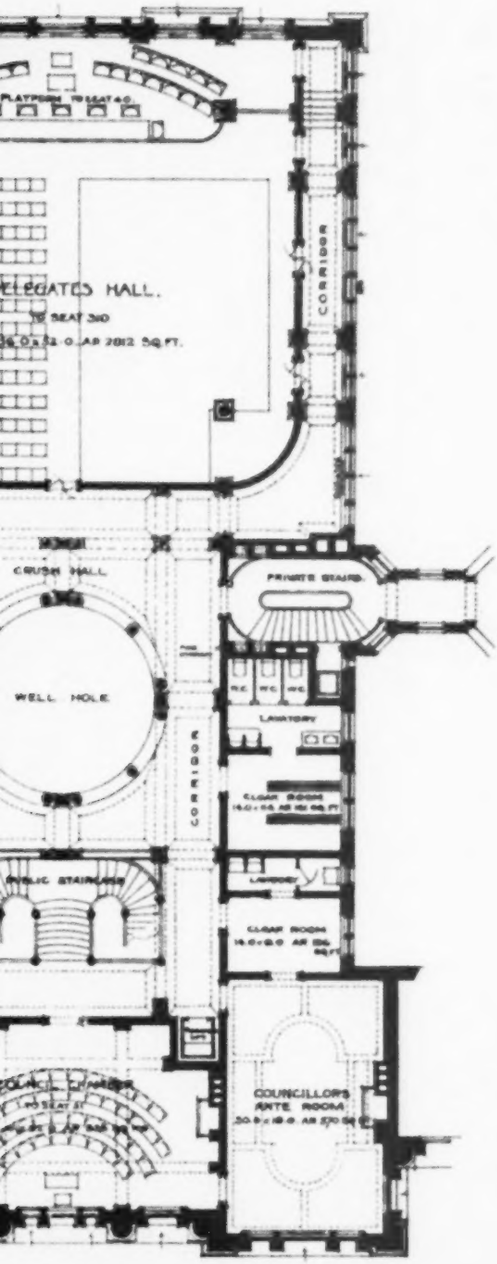

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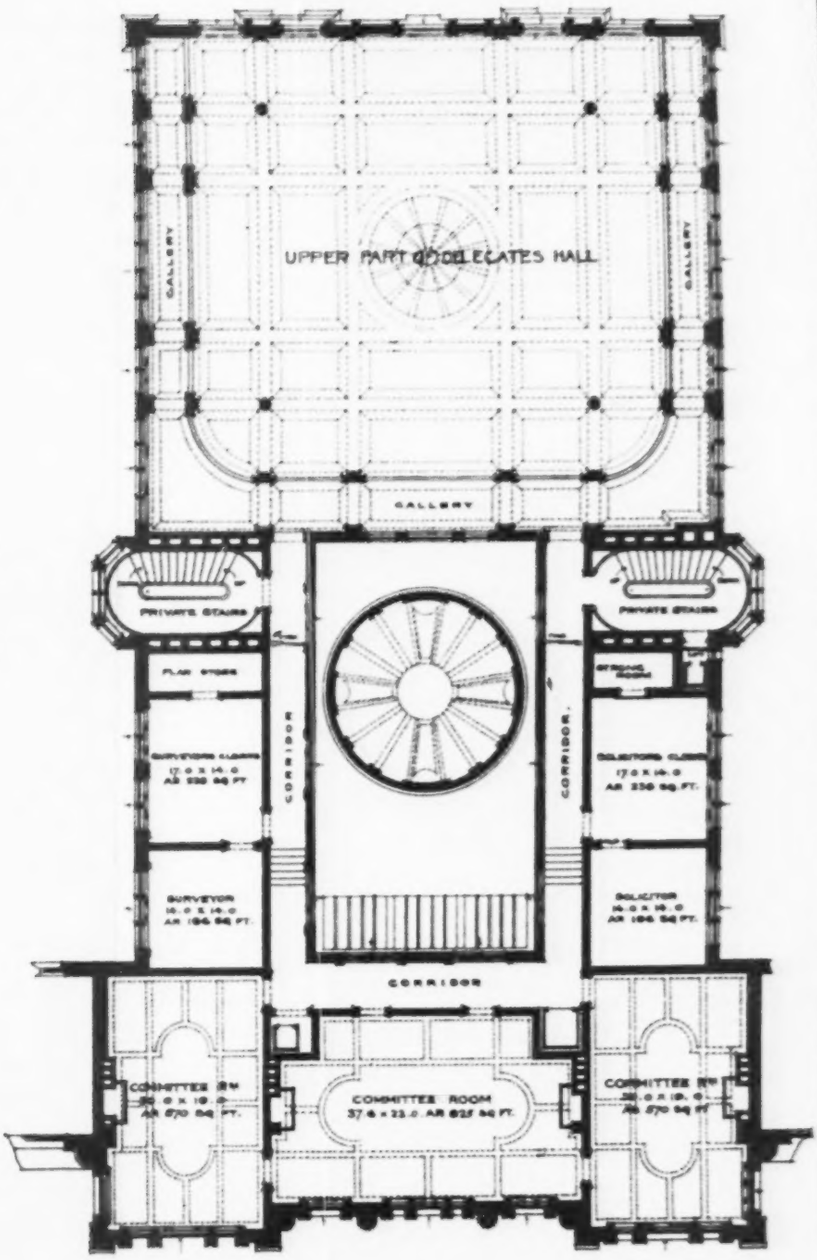

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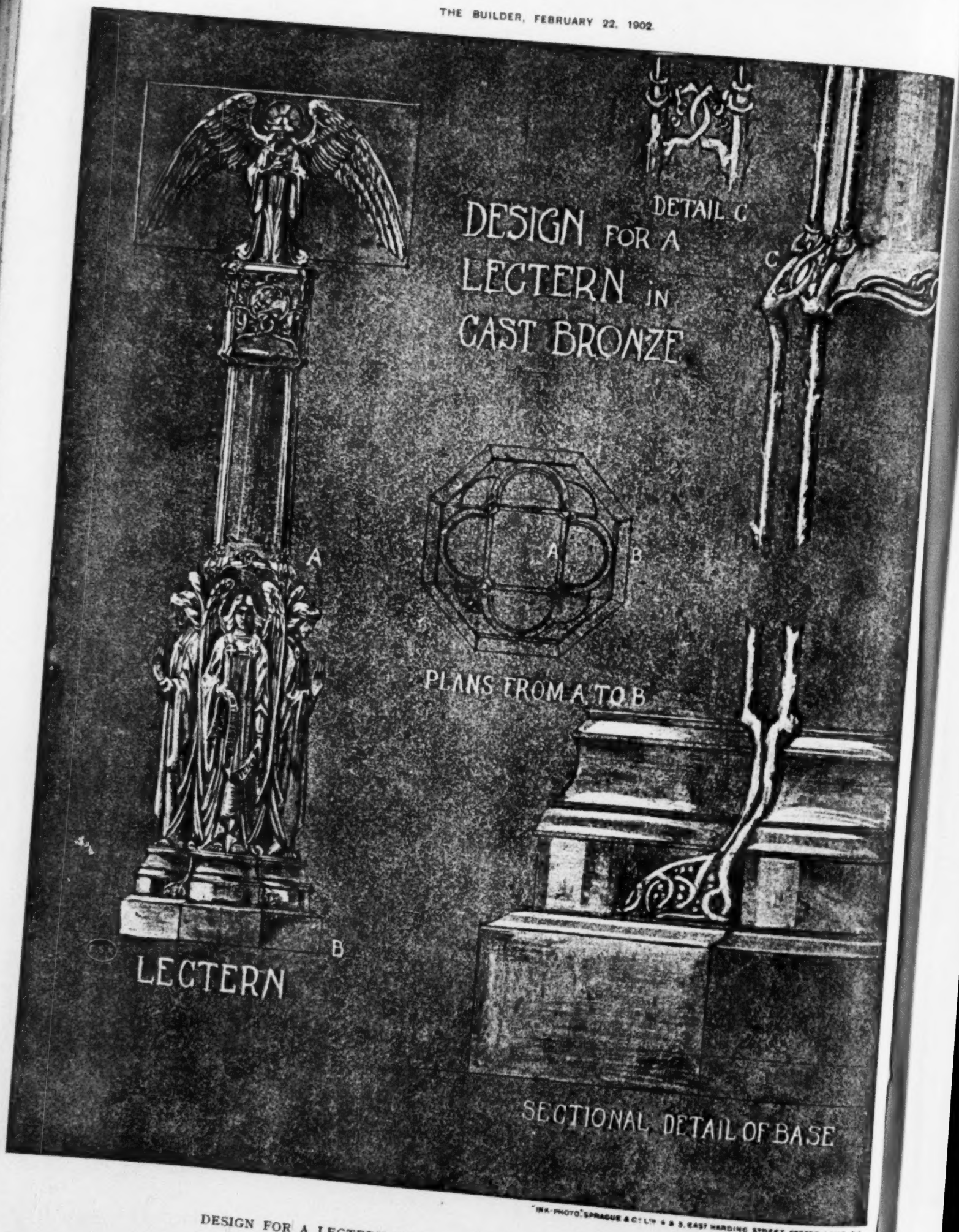
ED DESIGN.—Messrs. Essex, Nicol & Goodman, Architects.



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DESIGN FOR A LECTERN IN CAST BRONZE.—By Miss S. Thompson.

THE HALL, BROCKLESBY PARK.—MR. REGINALD BLOMFIELD, F.S.A., ARCHITECT.

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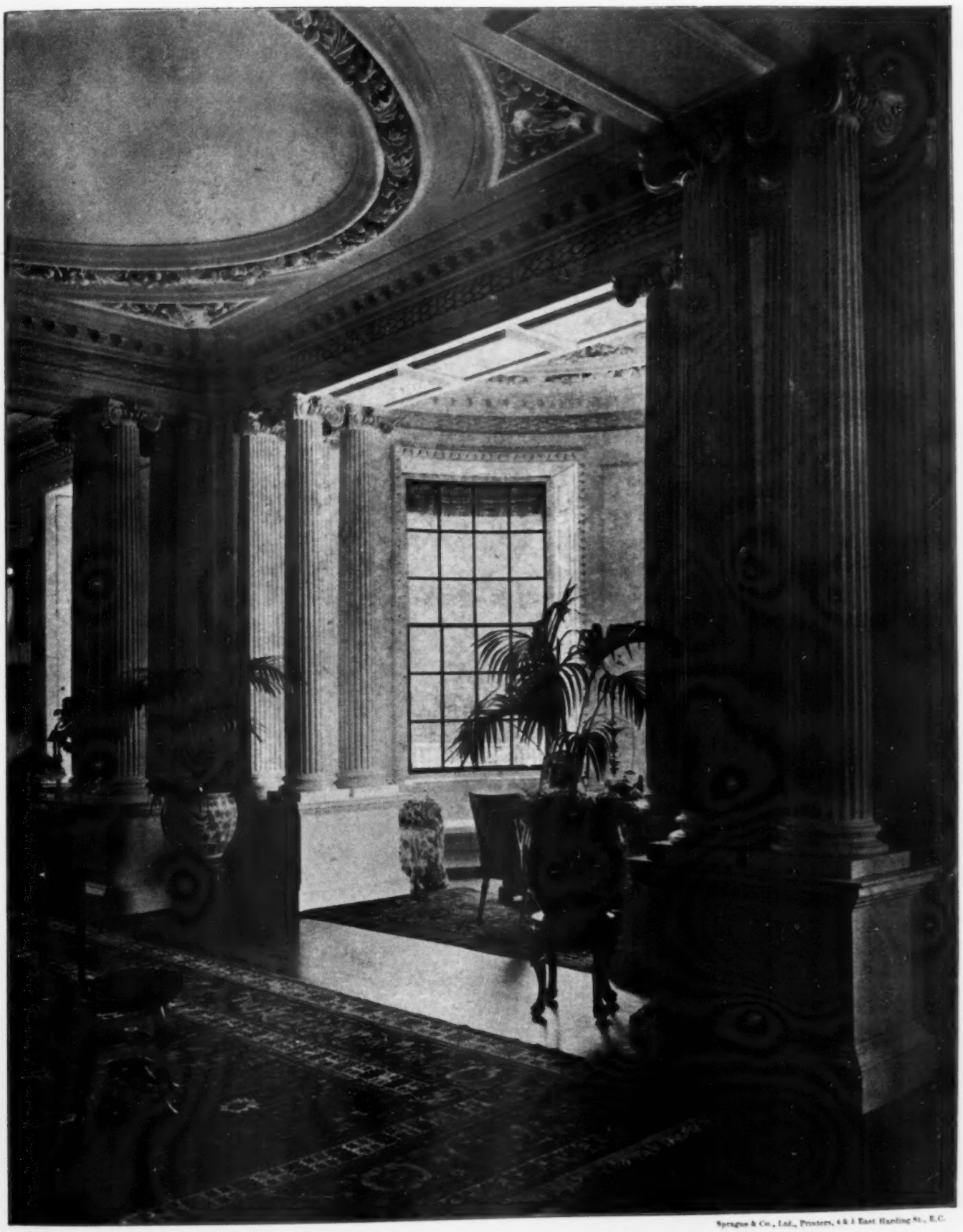

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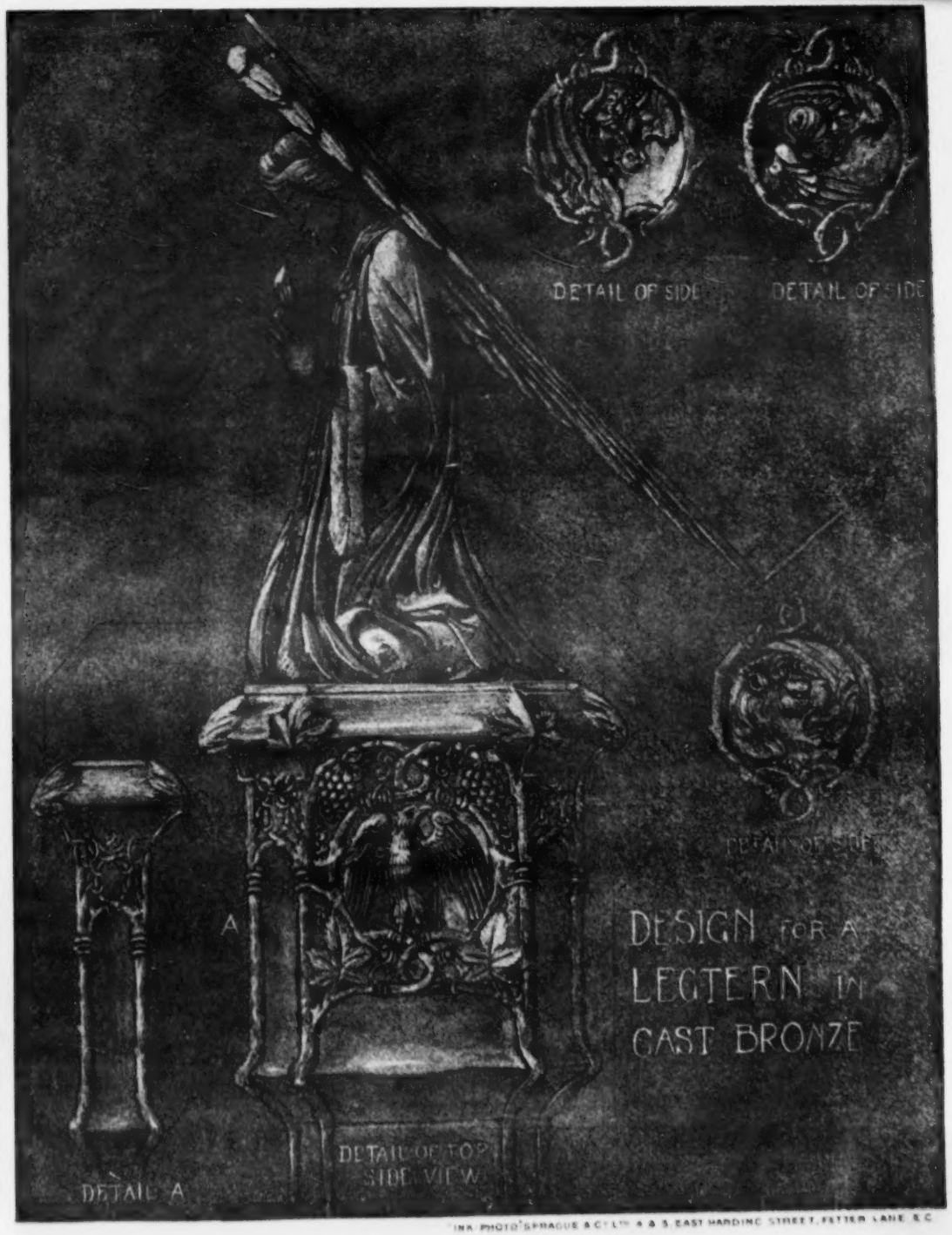
PART OF DRAWING-ROOM, BROCKLESBY PARK.—Mr. Reginald Blomfield, F.S.A., Architect.



DESIGN FOR A LECTERN IN CAST BRONZE.—By Miss S. Thompson

damaged conductor without disturbing decorations or plastering. In conclusion, it was urged that the electrical work in a building should be started in good time, and not left till the structure was too far advanced.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The members of the Leeds and Yorkshire Architectural Society held their annual dinner at the Queen's Hotel on the 11th inst. Mr. Butler Wilson, the President, was in the chair. Mr. J. Hepper proposed the toast of "The Royal Institute of British Architects and Allied Societies," and observed that every man ought to have a high ideal in his profession. Unless his ideal was above himself, he had not the incentive to make the best of himself. Mr. Hepper went on to refer to the fortunate position of the architect who combined in his work both the capacity for scheming plans that were essentially practical and useful and the capacity of artistic designing at the same time, without additional cost. The President, who responded, briefly alluded to competitions. So long as architects had to start without clients and so forth, they must continue to go on the market, and find a start in life in the competition world. But they had a right to expect that the assessors in these competitions should be men who had had a practical experience in the particular class of buildings that was under consideration. Otherwise, their awards could scarcely give general satisfaction. Continuing, Mr. Wilson said that there was to-day a very strong movement in the direction of dealing with architectural problems in a quiet manner, and with a consideration for the requirements of their clients, without any regard to style or period. The advanced school had carried out this idea to an extreme degree. It appeared to him unreasonable that men should be asked to forget the architectural beauties of Yorkshire, for example. They must not be asked seriously to ignore the great store of knowledge which the world had placed at their disposal. There was no reason why they should not store themselves with this knowledge, and, at the same time, be prepared to deal with every architectural question put before them strictly on its merits. In conclusion, such societies as theirs, said the President, must, to be successful, be based upon unselfishness. Alderman Wurtzburg gave "The Leeds and Yorkshire Architectural Society," and incidentally, when speaking of the architectural improvements that had been effected in the city during the past few years, said that Leeds people used to be known as "loiners." In view of the number of arcades that had sprung into existence, he thought that Leeds might now be called Arcadia, and its people Arcadians. Mr. G. F. Bowman responded. In giving the toast of "The Guests," Mr. W. H. Thorpe deprecated the evils that the competition system brought with it. Architects were put to a great deal of expense, and with no return in the majority of cases. He suggested that the evil might to a certain extent be minimised if a system of limited competition were adopted, by which, say, half a dozen members of the profession would be invited to send in plans, the unsuccessful competitors to receive an honorarium for their work. The toast was responded to by Mr. J. W. Brooke.

DUNDEE INSTITUTE OF ARCHITECTURE.—On the 8th inst., Mr. Charles J. Menart delivered a lecture before the Dundee Institute of Architecture in the Technical Institute on "British and Continental Architecture," Mr. J. P. Bruce presiding. Mr. Menart said that in his travels abroad he had found that the various styles of architecture in their native countries were often beautiful, but they were something very different when taken to other countries without any attempt being made to adapt them to their new surroundings. The architect of the Wallace Monument at Stirling was a true artist, but the man who proposed to erect a copy of the Parthenon on the Calton Hill, at Edinburgh, was not, and it was perhaps fortunate that the latter building was not completed. The architects of Greece and Rome suited their buildings to the climate. Owing to the bright sunshine their buildings did not require much window space, whereas in this country some buildings were nearly all glass in front. The Gothic churches were intended for processional purposes, and were designed accordingly, but it was a mistake to copy them for a Presbyterian form of worship, where the sermon was the chief part of the service. Dealing with Scottish architecture, he said the baronial castles were the true expression of the country and its people. There had been talk of putting a crown on the Old Steeple, but he thought that would be a mistake, as the steeple was beautiful as it stood.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—At a meeting on Tuesday evening (the President, Mr. H. G. Luff, of Devonport, in the chair), a lecture on "Bacteria in relation to Sanitation" was delivered by Dr. Ransome Pickard, with illustrative diagrams and microscopic slides. After dealing with the classification of forms and reproduction of bacteria, the lecturer proceeded to describe their functions in the process of decomposition, especially with regard to the microbe action in the purification of sewage, as brought into play in the septic-tank treatment. Important points with regard to hospital construction were touched on, attention being drawn to the production of spores and the difficulty of dealing with them and of destroying some of the bacilli with ordinary means of disinfectants, and the precautions adopted in the modern operating theatres to guard against infection. Ventilation was discussed, and also the problem of sanataria, which is being daily more forced upon the attention of the public and the medical profession at large, who were, however, not quite decided as to the question of the best sites.

ST. CATHERINE CREE, AND ST. JAMES, DUKE-PLACE, UNITED BENEFICE.

THE Corporation and the Bishop of London, the Master and Fellows of Magdalene College, Cambridge, and the Ecclesiastical Commissioners have just ratified a scheme concerning this united benefice, of which Magdalene College and the Corporation are joint patrons, presenting an incumbent alternately. The measure relates to the application of a surplus sum of 2,015*l.* of a certain fund to the endowment or augmentation of the income or otherwise for the incumbent's benefit, a parsonage-house having been recently provided therefrom. The fund arises from the investment of three-tenths of the proceeds of the sale of the site, materials, and furniture of the Church of St. James, in Duke's, since St. James's-place, Aldgate, which was demolished in 1878, when the benefice was united with that of St. Catherine Cree, or Christ Church, in Leadenhall-street. The church was originally built in 1622 for the inhabitants of that quarter, who, since the dissolution of the priory of the Holy Trinity, or Christ Church, had been left with no place of worship in their midst. Their cause was zealously supported by Sir Edward Barkham, elected Lord Mayor in 1621; they addressed a petition to the King, who, it appears, *teste* Stow, suggested the dedication to St. James. The church was rebuilt in 1727, of brick, in a very plain style, and repaired in 1823; the tower had windows dressed with stonework from, it is believed, the former structure and the earlier priory buildings. Mr. H. W. Brewer's drawing, "Aldgate, A.D. 1531," published in our issue for January 2, 1897, delineates the Priory and Church of the Holy Trinity, founded for her confessor Norman, an Augustinian canon, and endowed with her yoke at Aldgate by Queen Mathilda (of Scotland) in 1108, on the site, it is said, of a church which Syder, or Suedyr, a canon of St. Paul's, had erected in honour of the Trinity and St. Mary Magdalene. The priory, suppressed in 1531, became one of the wealthiest in England. King Henry VIII. bestowed the buildings and precincts in 1534, upon his Lord Chancellor, Thomas Audley, Lord Audley of Walden, who, Stow says, pulled down the steeple (perhaps the western tower) and most of the church. He altered the monastic dwellings for his own residence, assigning a lodging therein to Holbein, and gave St. Catherine's to Magdalene College. Margaret, his sole daughter and heir, married, in 1537, Thomas Howard, fourth Duke of Norfolk; their son Thomas, Earl of Suffolk, sold the priory and Audley's mansion-house to the City of London and built Audley End with the proceeds in 1603; in 1650 Oliver Cromwell gave the Jews license to settle there. The *Home Counties Magazine* lately reproduced, with an article by Professor Lethaby, two very interesting and finely-drawn surveys made in or about 1592 by J. Symans, or Symonds, master mason at Dover Harbour, and preserved at Hatfield House, consisting of the "grownd plat" and "second story" of Cree Church with the buildings and precincts. St. James's Church, it seems, was built on the site of the chapter-house, about 56 ft. by 30 ft., which stood between the dorter and the north transept; Mitre-square represents the cloisters, and a court at the angle of Mitre-square, by the warehouses in the south-east of the square which have replaced St. James's Church, marks the site of the north transept.

PAINTING PRACTICES IN THE UNITED STATES.

A REMARKABLE paper on "The Composition of Paints and Pigments" has been communicated to the New York Section of the Society of Chemical Industry by Mr. Maximilian Toch. Many English builders and engineers will disagree with some of the conclusions drawn by Mr. Toch concerning the relative values of the different pigments, but his deductions are made from observations of the durability and covering power of the different paints on exposed buildings and structures, and are of a very practical nature.

The author of the paper discusses his subjects in the following order:—Red lead, white lead, zinc oxide, carbon blacks, oxides of iron, barium sulphate (natural and artificial), zinc sulphide, casein paints, Japanese or China wood oil, tar, benzine, turpentine, maize oil, linseed oil, and hydrocarbon or bitumen paints.

About thirty million gallons of mixed paint (ready for use) were sold in the United States in the year 1901, and, according to Mr. Toch, many manufacturers use a small quantity of water in their mixtures. This water is not regarded as an adulterant when the quantity does not exceed 2 per cent., and "the water used is usually slightly alkaline, and in the case of lime water it forms a calcium soap with linseed oil, and thickens the paint so that it never settles hard in the tin and is easily stirred."

Mr. Toch considers that the value of red lead has been much over-estimated, that it is only good on account of its high specific gravity, and that a paint consisting of 70 per cent. barytes, 10 per cent. carbon black, 10 per cent. zinc oxide, and 10 per cent. graphite, ground in pure linseed oil containing a sufficient quantity of driers, will outwear red lead.

It is stated that in June, 1899, the outside walls of a most exposed building in the city of New York were first coated with a hydrocarbon paint to close the pores of the brick, and that over this two coats of a linseed-oil paint were then applied, the paint being composed of 25 per cent. barium sulphate, 25 per cent. white lead, and 50 per cent. zinc white. The walls are still in perfect condition, no damp has penetrated, and no peeling or disintegration of the paint has taken place. It is claimed that "this proves that barium sulphate fills up the pores of linseed oil, and that this proportion of zinc oxide and lead carbonate, in which zinc oxide predominates, is the most suitable for that locality." It is also remarked that if paint will stand in the atmosphere of the Atlantic coast it will last much longer in the interior, for the best paint rapidly deteriorates at the sea shore.

In conclusion, Mr. Toch remarks that the statement that iron or steel imbedded in concrete cannot rust is incorrect, and that unless the metal be well coated with a varnish paint containing bitumen, it will rust and disintegrate; but that "clean steel, embedded in a coating of cement which is properly trowelled, cannot rust, even though subjected to the worst conditions."

BOOKS RECEIVED.

VELASQUEZ, HIS LIFE AND WORKS. By Hugh Stokes. (Art Record Press. 1s.)

CONDITIONS OF CONTRACT. By Frank W. Macey. (Sweet & Maxwell, and B. T. Batsford.)

CLAY'S SUCCESSFUL GARDENING: Second Edition. (Clay & Son. 6d.)

INVESTMENTS IN HOUSES AND LANDS. By R. Deany Urlin. (National Mutual Life Assurance Society. 1s.)

PROPOSED TOWN HALL, HAMPSTEAD.—It is stated that the Borough Council have under consideration a scheme for building a new town hall, at an estimated outlay of 40,000*l.* for the fabric. The present Vestry Hall, at Haverstock Hill, was erected after the designs of Messrs. H. E. Kendall and Frederick Mew, as joint architects.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Lewisham.—Houses in Brightside-road, Saravia-road, Elthruda-road, Nightingale-grove, and Mallet-road, Hither-green, Lewisham (Mr. G. Tolley for Mr. J. Laird).—Consent.

Clapham.†—A detached house on the north side of Poynder's-road, Clapham, at the corner of Rodenhurst-road (Messrs. R. Price & Son for Mr. S. H. Poulton).—Consent.

Fulham.†—The retention of a shed in the garden at the rear of No. 77, Gunterstone-road, Fulham, abutting upon Glazbury-road (Messrs. Squire & Potter).—Consent.

Hampstead.—A wooden hood over the entrance to a dwelling-house in course of erection on the north-east side of Lindfield-gardens, Hampstead (Mr. W. J. King for Mr. H. W. Preston).—Consent.

Kensington, South.—A building on the eastern side of Warwick-road, Kensington, northward of No. 104 (Mr. W. A. Large for Messrs. Bishop & Sons).—Consent.

Lewisham.—Two houses on the south side of Brownhill-road, Lewisham, to abut upon Hither Green-lane (Mr. A. C. Baker for Messrs. Backhouse Bros.).—Consent.

Marylebone, East.—An iron and glass shelter at the entrance to Bechstein Hall, Nos. 36 and 38, Wigmore-street, St. Marylebone (Mr. T. E. Collcutt for Mr. E. Bechstein).—Consent.

Walworth.—An addition to the Town Hall, Walworth-road, Walworth, to abut upon Wansey-street and Ethel-street (Mr. A. Harrison for the Council of the Metropolitan Borough of Southwark).—Consent.

Westminster.—A portico at the entrance to a block of residential flats on the south-west side of Emery Hill-street, Westminster (Mr. E. J. Stubbs for Messrs. J. Allen & Sons, Limited).—Consent.

St. Pancras, South.—That the Council's resolution of December 3, 1901, sanctioning the retention of a wooden facia and cornice fixed round the base of a projecting oriel window at the north-western angle of No. 28, Rathbone-place, Oxford-street, be modified in accordance with the request of Mr. P. Dollar, by the omission of words.—Agreed.

Dulwich.—A three-story bank building on the site of Nos. 64 and 66, and of one-story shops upon part of the forecourts of Nos. 60 and 62, Lordship-lane, East Dulwich (Messrs. R. C. Harrison & Son for the London Joint Stock Bank, Limited).—Refused.

Hackney, Central.—One-story shops on part of the garden of No. 45, Avenue-road, Clapton (Mr. W. Rainbow).—Refused.

Islington, West.†—One-story shops upon the forecourts of Nos. 85, 87, and 89, St. James's-road, Holloway (Messrs. Borges & Rumball for Mr. J. J. Jones).—Refused.

Lewisham.—Houses, with one-story shops in front, on the east side of Ardgowan-road, Hither-green, Lewisham, at the corner of Dowanhill-road (Mr. A. C. Baker for Mr. J. Harwood).—Refused.

Marylebone, West.—A stone portico at the entrance to No. 48, Bryanston-square, to abut upon Upper George-street, St. Marylebone (Mr. C. Young for Viscount Chelsea).—Refused.

St. George, Hanover-square.—Fixing of iron and glass screens on each side, and in front, of the shelter at the entrance to the Buckingham Palace Hotel, Buckingham-gate, St. George, Hanover-square (Mr. W. Woodward for the Buckingham Palace Hotel Co., Ltd.).—Refused.

Strand.—A building on the site of Nos. 27 and 28, Pall Mall and Nos. 24 and 25, St. James's-square, St. James's, with projecting balconies (Mr. F. E. Williams for the Wilkinson Sword Company).—Refused.

Width of Way.

Hackney, Central.—A one-story addition to a building in the garden of No. 97, Lansdowne-road, Hackney (Mr. A. Cook).—Consent.

Bow and Bromley.—The rebuilding of No. 180, Roman-road, Old Ford, with the external walls of the new building at less than the prescribed distance from the centre of the roadway of Dane-place (Mr. R. R. Bostock for Mr. C. J. Bone).—Consent.

Brixton.—A two-story house on the west side of Farmer's-road, Lambeth, northward of No. 86, with the external walls of such house at less than the prescribed distance from the centre of the roadway (Mr. A. E. Symes for Mr. C. Newbury).—Consent.

Chelsea.†—A billiard-room at the rear of No. 61, Cadogan-place, Chelsea, with the external walls of such billiard-room at less than the prescribed distance from the centre of the roadway of Little Cadogan-place (Messrs. Alder & Turrill for Mr. J. Turrill).—Consent.

Hampstead.—The retention of a summer-house in the grounds of the North London Hospital for Consumption, Mount Vernon, Hampstead, with the external walls of such summer-house at less than the prescribed distance from the centre of the roadway of the street (Messrs. Roff & Son for the Committee of the North London Hospital for Consumption).—Consent.

Space at Rear.

Fulham.—A modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the site of Nos. 67 and 69, New King's-road, Fulham (Messrs. Thorpe & Furniss for Mr. F. Bishop).—Refused.

Width of Way, Lines of Frontage, and Projections.

St. George, Hanover-square.—An oriel window and balcony in front of No. 7, Bolton-street, Piccadilly (Messrs. Cubitt, Nicholls, Sons, & Chuter for the trustees of the Sutton Estate).—Consent.

Marylebone, West.—A one-story addition and three stone steps at the rear of No. 21, Montagu-square, to abut upon Gloucester-mews West, St. Marylebone (Messrs. Smith & Brewer for Mr. G. Lewis).—Consent.

Kensington, South.—An oriel window at the first floor level in front of No. 26, Yeoman's-row, South Kensington (Mr. T. Lott for Miss E. McCallum).—Refused.

Rotherhithe.—A three-story warehouse on the south-west side of London-street, Dockhead, Rotherhithe (Mr. V. Dunkerley for Messrs. W. & R. Jacobs & Co., Ltd.).—Refused.

Wandsworth.—A one-story shop front at No. 253, Upper Richmond-road, Putney, at less than the prescribed distance from the centre of the roadway of Lower Park-fields (Mr. W. J. Renshaw for Mr. A. Gerhold).—Refused.

Lines of Frontage and Construction.

Bow and Bromley.—The retention of an iron and concrete timber-drying stage at Tredegar Works on the south-west side of Ordell-road, Bow (Messrs. Perry & Co.).—Consent.

Formation of Streets.

Lewisham.—A further variation from the plan sanctioned on March 7, 1899, for the formation or laying-out of a portion of Adamsrill-road, Perry Hill, Catford, so far as relates to a deviation in the position of that road (Mr. A. J. Dorrell).—Consent.

Means of Escape from the top of High Buildings.

Strand.—Means of escape in case of fire, proposed to be provided in pursuance of Section 63 of the Act, on the fifth, sixth, seventh, and eighth stories of an addition at the rear of the Grand Hotel, Northumberland-avenue, Charing-cross, next Northumberland-avenue (Mr. W. Woodward for the Gordon Hotels, Ltd.).—Consent.

City.—Means of escape in case of fire, proposed to be provided on the eighth, ninth, and tenth stories of a building known as Salisbury House, on the north side of London Wall, City, abutting upon Circus-place, Finsbury-circus and West-street (Davis & Emanuel for Mr. L. Newmann).—Consent.

*** *The recommendations marked † are contrary to the views of the local authorities.*

THE CHURCH CRAFTS LEAGUE.

THE first general meeting of the year was held on Monday evening last in the Hall of Clifford's Inn, when a crowded audience assembled to hear Mr. Roger Fry's lecture on "Art Patronage of the Church in Italy during the Fifteenth Century." The Bishop of Rochester was in the chair. Mr. Fry gave a description of the relationship which existed between the church in Italy and the great artists of the fifteenth century. He explained the characteristics of the various painters and sculptors of the time, and gave lantern illustrations of some of their typical works. At the conclusion of the lecture, Mr. Charles Holroyd (keeper of the Tate Gallery) said it was the custom in the fifteenth century for a wealthy family to make itself responsible for the decoration of a certain portion of a church, and to employ the best artist it could procure to carry out the work. He thought that some such plan might be adopted now with good results. Mr. Selwyn Image protested against the idea that one man must be responsible for all the decorative work of a church. If real artists were employed, they would all be actuated by the same spirit, and the result of work done in such a way would not be lacking in unity of purpose. Mr. Henry Holiday briefly mentioned the drawbacks under which modern artists had to learn the technique of their art. Instead of being taught in schools by the best men of their day, the young artists had to spend years of independent labour in mastering technical difficulties.

REBUILDING AT CHARING CROSS.—The block of old houses, distinguished by their bay windows, at Charing-cross, being Nos. 62-3-4-5, will shortly be pulled down to make way for new premises which are to be erected for the Canadian Pacific Railway Company. The four houses stand between the Sun Insurance Office and the Union Bank of London. No. 64 was the shop of the long-established firm of Holtzapffel & Co., machine-tool and instrument makers, who have taken new premises at Nos. 13-4, New Bond-street. Designs for the new buildings have been prepared by Mr. G. Richards Julian.

Correspondence.

THE AMENDMENT OF THE LAW OF ANCIENT LIGHTS.

SIR,—My attention has been drawn to the concluding words of your article on "Ancient Lights" in the *Builder* for the 15th inst. In these words you intimate your fear that the Report of the Joint Committee of the Royal Institute of British Architects and the Surveyors' Institution on the subject is likely to remain without practical result. At any rate, it has passed beyond the report stage, for it was referred back by the councils of the two bodies to the committee, with authority to spend the necessary money and take the necessary advice in order to draw a Bill embodying its provisions. This Bill has been drawn, and I understand that it is under the consideration of one of the Councils, having been already adopted by the other.

On a subject where great differences of opinion exist, it is not unlikely that considerable discussion may have arisen, though I heartily join in the regret you express that so much time has passed. I may point out that if our Bill, in the shape which the Joint Committee approved, becomes law, the view which Mr. Justice Wright's judgment would have established will be enacted by statute. Both Councils are, I think, committed in honour to attempt legislation.

T. ROGER SMITH,
Chairman of the Joint Committee.

COMPETITIONS.

SIR,—I have read with interest a letter from "Non-Competitor" in your number of the 15th inst., in which he instances the Hull competition drawings. I think it but justice to the Committee to state that they quite agreed with my suggestion that no perspectives were to be sent in; and although some of the competitors, when questions were sent in, wished to be allowed to send perspectives, we replied, "Assessor strongly objects to perspectives in a competition." I think they (except, of course, before a building is erected) are quite unnecessary. I particularly mentioned in the Hull conditions (as I have done in previous conditions) that competitors need not make elaborate drawings, and suggested that they should save themselves as much work as possible.

One cannot but feel that with an assessor who understands what plans and elevations are, pencil sketches (and those one-sixteenth scale) should be ample for all competition purposes.

I think "Non-Competitor" has over-estimated the cost of the Hull drawings, considering there were no perspectives. I was very grieved to see so many drawings, and some of them so carefully done. Unfortunately, though the draughtsmanship was good, in many instances the plans, owing to "so much originality," were obliged to be set aside on the question of cost. I am afraid this is too much an age of utilitarianism for many who compete. I unhesitatingly say that 75 per cent. of the designs in this competition were quite impracticable either in plan or elevation—some in both.

It is very painful to an assessor to see so many designs, but it is not alone in architecture that competition is so keen, as every one must know. Architectural competition has undoubtedly brought many a young man to the front, and one feels that it is a necessary evil; the only thing for the Institute to do is to ask committees to insist on competitors only making pencil sketches, and those to a small scale. If I am placed in the position of assessor again (in any case), I shall endeavour to carry this view out, but I must say at Hull (this being a small building) we felt it necessary to have ¼-scale drawings; though, as I have previously mentioned, we particularly made it clear that competitors were not to take more trouble than was absolutely necessary. In this particular case, I think and hope, the first-placed competition drawings will be of use, because they will no doubt be submitted to some boards for sanction, and it would be necessary, in any case, to make preliminary plans before working drawings were finally made.

The drawings were on view to the public with the reports in every case attached. No doubt in competitions where so many drawings are sent in there must be some heartburning

(no doubt possible mistakes in assessing), but one can see no remedy except to endeavour not to multiply the work of competitors. It is a subject one might write on to indefinite lengths, but I have endeavoured to express my views as concisely as I can.

SIDNEY R. J. SMITH.

BUILDERS' ACCOUNTS.

SIR,—Having been engaged with "Builders' Accounts" for many years, I was interested by your review of a new book on the subject by Mr. John A. Walbank, and the author's letter in your issue of February 8. Mr. Walbank is to be congratulated on his concise and able treatment of the subject, but I venture to suggest that much of the detail might with advantage have been omitted, and that some attention ought to have been given to detail costs.

The most satisfactory system I have had experience of would not, I am afraid, commend itself to Mr. Walbank. In this system the costs are kept in an independent set of books, with the result that their accuracy is not checked save in a very approximate manner, but they are rendered non-essential, and either detail or general costs could be abandoned under pressure or by small builders.

With regard to "tender" book, the abstracting of labour and materials in tenders is an unprofitable labour, and it would be better to keep the record of tenders and comparison of results in separate books. The stores account need only be kept for home yard, and in the case of small builders is unnecessary, but the plant journal and ledger should never be dispensed with.

All builders who have neither the time nor knowledge of accounts to go thoroughly through their own books should certainly have them audited, but it is a regrettable fact that many otherwise practical builders neglect this department, and their offices are understaffed and underpaid, with the result that the books are too often hopelessly behind and slovenly kept.

THOS. E. BROWN.

NUMBER OF BRICKS LAID IN A DAY.

SIR,—I have made many inquiries on different jobs, and find that the number of bricks laid by each man in ordinary plain work varies from 400 to 600 per man per day. Most foremen agree that some years since each man laid 1,000 bricks.

HENRY LOVEGROVE.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 7.—HYDRAULICS (*continued*).

IT is not always possible to obtain the gradients recommended in the last chapter. The depth of the sewer and the level of the lowest floor of the premises to be drained may allow only a small fall to be given to the drains. In such cases, the main drain may be laid with a smaller inclination, and periodically flushed by means of an automatic tank at the head. All (or nearly all) the branches can, if this is done, be laid at proper slopes.

An objection often raised to quick gradients is that they necessitate deeper trenches, and that the drains are consequently more costly. This is not true in every case. In houses built on the slope of a hill it is often more economical to adopt quick gradients following in the main the natural slope of the ground, rather than a series of drains of low inclination stepped at manholes and lampholes. Fig. 3 will make this clear. The ground has a general slope of 1 in 20. The full line shows a 6-in. outfall drain laid to a slope of 1 in 24. The dotted lines show the arrangement required if a regular slope of 1 in 60 is maintained. In both cases the drain is at no place less than 2 ft. 6 in. below the surface. The drain with the smaller inclination obviously involves deeper trenches, and (unless the trenches run to a great depth) more manholes or lampholes, on account of the greater number of steps in the drain. The excavation required for the 1-in-24 drain is represented by the oblique shading; the dotted oblique lines in the same direction show the additional excavation required for the 1-in-60 drain if an additional manhole or lamphole is constructed at A. If this is not provided, still more digging will be required as shown by the reversed oblique dotted lines. In either case the flatter gradient involves a deeper manhole at B.

A word of warning must be uttered with regard to the different slopes allowed for pipes of different sizes. Many persons appear to think that if the levels of the drain-inlet and sewer will only admit of a slope of, say, 1 in

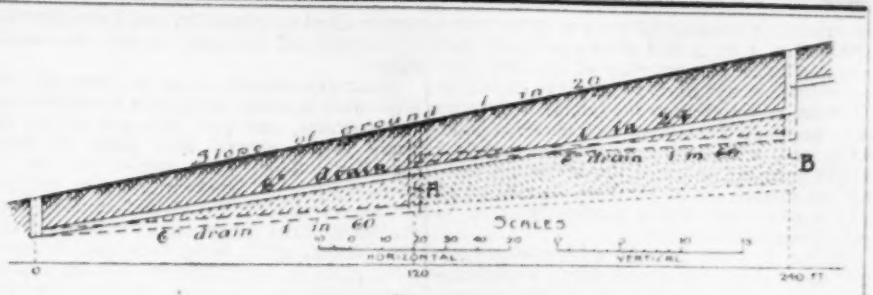


Fig. 3.

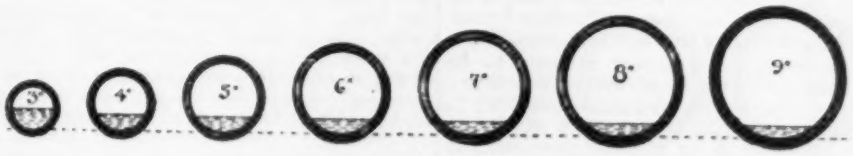


Fig. 4.

60 being given to the drains, 6-in. pipes ought to be used, whereas, if a gradient quicker than 1 in 40 can be obtained, a 4-in. drain may be used. The fact is that the larger drain ought to be used only in those cases where there is a correspondingly greater flow of sewage. In Table III. it was shown that a 4-in. pipe laid to a slope of 1 in 34 and flowing one-third full discharges sewage at the rate of 3·91 cubic ft. per minute, the velocity of the flow being 2½ lineal ft. per second. To produce the same velocity in a 6-in. drain laid to a slope of 1 in 65, there must be a discharge at the rate of 8·84 cubic ft. per minute. If this larger quantity of sewage is not passed through the pipe, the depth of the flow will be reduced, and the velocity will fall below the assumed minimum of 2½ ft. per second.

For purposes of comparison, reference may be made to fig. 4. A 3-in. pipe laid to a gradient of 1 in 40 and flowing half-full is taken as the standard. This is estimated to discharge 3·32 cubic feet per minute, the velocity of the flow being 2·25 lineal feet per second. In the larger pipes the depth of flow will be as shown, and as the hydraulic mean depth becomes less with each successive increase in the diameter of the pipe, the velocity is reduced, so that in the 9-in. pipe it is slightly less than 2 ft. per second, *although the gradient remains the same.*

If the 9-in. pipe had been laid to give a velocity of 2·25 ft. per second when flowing half-full—thus corresponding with the 3-in. pipe—the gradient would have been 1 in 237, and the velocity of the flow, when 3·32 cubic feet per minute were passing through the pipe, would have been barely 1 ft. per second.

Large pipes, therefore, are a positive disadvantage unless the quantity of sewage is proportionate to their capacity. If the sewage is only sufficient for a 4-in. pipe, and a 6-in pipe must (in consequence of local regulations) be used, the latter must be laid at a slightly steeper gradient than would have been necessary in the case of the smaller pipe.

The Size of Drains.—The model by-laws (both urban and rural) issued by the Local Government Board, and the new drainage by-laws of the London County Council, require every drain "to be of adequate size, and, if constructed or adapted to be used for conveying sewage, to have an internal diameter not less than *four inches.*" This by-law leaves the size of sub-soil drains and rainwater drains to the discretion of the sanitary authority's surveyor or the architect or builder, but prescribes a diameter of at least 4 in. for sewage drains. Many authorities specify that main drains must be 6 in. in diameter, and branch drains 4 in.; others require that branch drains from water-closets to be also 6 in. in diameter; others, again, allow no drain to be less than 6 in. Under certain authorities "combined drains" must be at least 9 in. in diameter, even if only two small houses are served by the drain. The Board of Education considers a 4-in. drain suitable for as many as ten water-closets; for a greater number a 6-in. drain must be used.

Here again, very little can be learnt from official regulations, and the question must be considered with regard to the amount of sewage to be carried away in a given time. This differs enormously, according to the nature and size of the building, the area to be drained, the partial or total admission of rain-water, and other circumstances. The sewage produced in the labourer's cottage is obviously very different in quantity per person from that produced in the squire's mansion. If the rain-water falling on a country house and its curtilage is admitted to the drains, the sewage proper will be a very small proportion of the total flow in a thunderstorm. Subsoil-water, if admitted to the drain, may largely increase the volume of sewage. It is, therefore, impossible to lay down a hard-and-fast rule, but a little consideration will show that small drains will carry away a far larger quantity of sewage than is generally supposed.

In the example given in Chapter 5, the total daily flow from a middle-class house occupied by eight persons was estimated to be 220 gallons. This is equivalent to rather over 35 cubic ft. On reference to Table III. it will be found that a 4-in. drain, laid to a slope of 1 in 34 and running full, will discharge this quantity in about two and a quarter minutes; if the drain is running one-third full, the time occupied by the discharge will be less than nine minutes. Obviously, a 4-in. main drain can convey a much larger quantity of liquid than is likely to be produced in a dozen houses of this class. The branch-drains have still less to do. In such a house there will probably be, at least, six branch drains—say two for sinks, two for baths and lavatories, and two for water-closets. These will receive different proportions of the sewage, probably one-half going to the drain from the family bath and lavatory; the other branches will therefore receive very small quantities. The branch from the servants' water-closet will probably not have a greater daily flow than ten or twelve gallons. Four-inch branch drains are therefore much too large, as far as their carrying capacity and the flow of sewage are concerned.

We will now suppose that the rainwater must also be carried away by the sewage-drains. Taking a severe thunderstorm, with a rainfall of 1 in. in a quarter of an hour, as the basis of calculation, we have a flow of water at the rate of $\frac{5}{6}$ cubic feet per minute for every 100 square feet of roofed or paved surface to be drained. If this surface is 4,000 square ft., it will receive 22·2 cubic feet of rain per minute. Some portion of this will be lost by absorption and percolation, but the loss in a storm of this kind will be trifling, and need not be taken into consideration. Referring again to Table III., we find that a 5-in. drain, laid to the minimum gradient of 1 in 48, is capable of discharging 25·72 cubic feet per minute when running full; add 10 per cent. in order to obtain the maximum discharge (which occurs when the pipe is not quite full), and we get a maximum discharging capacity of 28·29 cubic feet per minute, that is to say, 6 cubic feet more than the rainfall. A main drain 5 in. in diameter is, therefore, capable of discharging 6 cubic feet (37½ gallons) of sewage per minute in addition to the rain-water.

The branch drains conveying rain-water to the main drain will probably be at least eight in number, some of which may also convey sewage. The areas served by the different branches will not be equal, but probably no branch will have to carry away more than one-fifth of the rainfall, or about 4·4 cubic feet per minute. A 3-in. drain laid to a gradient of 1 in 21 will discharge more than 9 cubic feet a

minute when running full; a 4-in. drain with a gradient of 1 in 34 will discharge more than 16 cubic feet. This quantity of 4·4 cubic feet per minute is not likely to be often reached in practice, as it represents the rainfall on an area of no less than 800 square feet, but even if we have, say, a courtyard 50 ft. square with a single gully in the centre, the maximum rainfall per minute will be less than 14 cubic feet, and a 4-in. drain with a gradient of 1 in 34 will, therefore, be ample.

As far as the combined volume of sewage and rain water is concerned, there is no necessity (save under the most exceptional circumstances) for branch drains of proper gradients to be more than 4 in. in diameter, and in the vast majority of cases 3-in. drains would never be charged to more than half their capacity.

The question which now remains to be answered is this: Is there anything in ordinary sewage which is likely to cause obstructions in small drains? This is a question which can best be answered by practical experience, or (failing this) by experiment. Unfortunately, the by-laws of Sanitary Authorities have in a large measure prevented the use of small drains, and there is probably not a Sanitary Authority in the country which would at this moment allow a sewage drain to be constructed of a less diameter than 4 in. Experience has shown, however, that the successive changes from large brick barrel drains to 9-in. pipes, and from these to 6-in., and from these again to 4-in., have been entirely successful; and there can be little doubt that the diminution will be carried still further. The reduction of soil-pipes to 3½ in. will probably be followed by a corresponding reduction in the size of branch drain-pipes, and both may eventually be still further contracted.

Many experiments have shown that 4-in. drain-pipes are better than 6-in. for brancnes. In 1896 Mr. Arthur B. Plummer, F.R.I.B.A., of Newcastle-upon-Tyne, carried out several series of experiments with 6-in., 4-in., and 3-in. pipes, and in every case the 6-in. pipes gave the worst results. In the first series two drains were laid, each about 83 ft. long. One length was formed of 6-in. drain-pipes with a fall of 1 in 40, and the other of 4-in. pipes with a fall of 1 in 60. In each case there was a bend about 12 ft. from the outlet end, and a Buchan trap in the course of the drain. A wash-down water-closet, with a 2-gallon siphon cistern and 1¼-in. flush-pipe, was used in the experiments. Artificial fæces composed of soft soap and sawdust were placed in the basin and flushed out in the usual way. The 6-in. drain was first tested. The first flush cleared the basin, but it was not till the sixth flush that half the charge came out at the mouth of the drain, and not till the eighth that the drain was cleared. Summing up this preliminary series of experiments, Mr. Plummer says that "although the 4-in. drain was not of so steep a gradient as the 6-in. drain, and although it also had a much more acute bend in it, the result of these experiments was decidedly in favour of the smaller drain-pipe."

Another series included experiments on 6-in. and 4-in. sanitary-pipe drains and 4-in. and 3-in. glass-lined iron pipes. These were laid alongside each other with a fall of about 1 in 40. The total length in each case was 82 ft., and each drain had an almost right-angled rounded bend 12 ft. from the outlet, and a trap 4 ft. in front of the bend. At a further distance of 8 ft. there was a junction from a water-closet, and at the head of each drain two water-closets were fixed over each other, as on the ground and first floors of a building. Four pieces of paper and a solid mixture of soft soap and sawdust weighing 6 oz. were used at each test, and each drain was tested by successive discharges from the first floor and ground floor closets at the head of the drain and from the closet along the course of the drain. The 6-in. drain was first tested. The three closets were charged and flushed in rotation twenty times, so that sixty deposits in all were passed into the drain. After the fourteenth round the drain was completely blocked; of 22½ lbs. of soap and sawdust put in, only 7 had passed out. The 4-in. sanitary-pipe drain gave better results, the charge passing through more freely, till a stoppage occurred at the end of the sixth round. The results with the 4-in. iron pipes are described as "satisfactory," and with the 3-in. iron pipes as "even more so—each charge practically came direct through the drain with each flush." A flush of 2 gallons was used in this series of experiments; with a flush of 2½ gallons, the 6-in. pipe worked satisfactorily, and it was therefore not considered necessary to test the smaller pipes.

These experiments seem to show that 3-in. pipes may be safely used, even for drains from water-closets, and that they are indeed less likely to be choked than pipes of larger diameter. Some tests carried out by Dr. Charles Porter, of Stockport, on 6-in. and 4-in. drains corroborate the view that small pipes are better than large ones for house drains. Two drains, 47 ft. long, were laid, one with 4-in. pipes to a gradient of 1 in 40, and the other with 6-in. pipes to a gradient of 1 in 60. Each drain had one rounded bend of 90 deg. and a disconnecting trap of the same bore as the pipe. A wash-down water-closet gave better results than a wash-out basin. With the latter (tested in connexion with a 4-in. drain) the closet-trap was cleared in every case by a 3-gallon flush, but the 4-in. disconnecting trap was cleared only twice. Twelve tests with 2½-gallon and 2-gallon flushes gave still worse results; in eight cases the closet-trap was not cleared, in five the drain was not cleared, and in every case the disconnecting trap retained a portion of the soil. The wash-down closet worked better; the closet-trap and 4-in. drain were always cleared by a 2-gallon flush, but in no case was this sufficient to clear the 4-in. disconnecting trap. A 2½-gallon flush was not much better; but 3 gallons invariably cleared the closet, drain, and trap. With a 6-in. drain (gradient 1 in 60) and a 6-in. disconnecting trap, even a 6-gallon flush cleared the trap only twice in four tests, and smaller flushes proved quite inadequate.

The moral is obvious—never use pipes of greater diameter than 4 in. for branch drains. Smaller pipes cannot yet be used (except in rural districts) on account of the local by-laws, but the time is probably not far distant when 3½-in. iron pipes will be allowed in place of 4-in. stoneware, and still further reductions will probably follow.

Large pipes are not only more likely to retain deposits, but they are also more difficult to ventilate and more costly. This question of cost is worth consideration, especially in country houses where the drains are of great length. The following list prices of stoneware pipes may prove useful in this connexion:—3-in., 6½d.; 4-in., 9d.; 5-in., 10½d.; 6-in., 1s. 1½d.; 7-in., 1s. 3d.; 8-in., 1s. 6d.; 9-in., 1s. 9d. To the difference in prime cost must be added the extra freight of the larger pipes, the extra labour and cement in laying, and the extra cost of the necessary bends, junctions, and traps.

OBITUARY.

MR. STEVENS.—We have to announce the death, in his seventy-sixth year, of Mr. James Stevens, of No. 88, Mosley-street, Manchester, and Chester-road, Macclesfield. Mr. Stevens was elected a Fellow of the Royal Institute of British Architects in 1877, and had been President of the Manchester Society of Architects. He enjoyed a considerable practice as an architect, surveyor, and valuer in Manchester, Macclesfield, and the localities around, and was employed as architect for the building of many large premises for business purposes. In 1882 he was instructed to prepare plans and designs for a complete restoration, with enlargement of the chancel and the north aisle, and new choir and clergy vestries, for the parish church of St Michael, Macclesfield, as illustrated in our columns of November 27, 1886—three views and a plan. The work was finished, as far as the funds permitted, and the capacity was increased to 900 sittings, in 1892. Mr. Stevens was also appointed as architect, at Macclesfield, for the erection for the Town Council of the Technical Schools on the site of the Useful Knowledge Society's premises at Park Green in February, 1898; the enlargement, with a new front and new Council Chamber (1869-70), of the Town Hall (originally built in 1823-4 after Francis Goodwin's designs); the Militia barracks in the Crompton-road (1858-9), for which he made the plans and designs after the Gothic style, in conjunction with Mr. Pownall, of London; the Chadwick Free Library, Park Green (1868-80), a gift to the Corporation by Mr. David Chadwick, M.P., in 1876; the School of Art, Park Green, of stone, in the Gothic style, opened in June, 1879; and the Infirmary near the Park (1870-2), for sixty in-patients, with quarters for the nurses' training-school.

HOTEL IMPROVEMENT, SHEFFIELD.—Improvements at the Royal Victoria Station Hotel, Sheffield, have just been completed. The architect for the new portion of the building was Mr. William Owen, of Manchester. The decorations have been carried out by Messrs. Goodall, Lamb, & Heighway, Manchester

GENERAL BUILDING NEWS.

THE RESTORATION OF IONA CATHEDRAL.—The Cathedral Church of Iona, which has for many years been in a dilapidated condition, is about to be restored. Founded by Reginald, Lord of the Isles, about the close of the twelfth century, the cathedral was at first used as a monastery, which was attached to a Norwegian diocese. Some of the evidences of its occupation by monks still exist in the remains of the chapter-house, cells, and dining-halls. Although it was first constructed in the twelfth century, most of the architecture is of a later period, probably of the fifteenth century. The cathedral, which is cruciform in shape, consists of a nave and choir, with aisles and north and south transepts, while a tower rises over the choir. The greater part of the building is roofless, including the choir, the aisles, and the south transept, and the present operations are to be confined to remedying that defect and thus making the edifice watertight. The question of roofing the tower and executing other details is at present under consideration. The height and form of the church roof are fixed by the existing east gable, which is entire, and also by the outline of the gable, which is seen against the central tower. It has been decided that the roof will be in strict conformity with the existing marks, and will be of the same dimensions as the original roof. The edifice will give accommodation for over a thousand persons, but it is not intended at present to erect seats. The architects are Messrs. M'Gibbon & Ross, Edinburgh, and the contractors Messrs. Mitchell & Sons, Edinburgh.—*Scotsman*.

CENTRAL HALL, PRIMITIVE METHODIST CHURCH, SOUTHSEA.—Building extensions have been made in Albert-road, Southsea, for the Primitive Methodists. The front elevation consists of a spire some 70 ft. high on one side, and a turret on the other side. There is a window in the front, 12 ft. wide and 16 ft. in height, with ornamental Bath stone work and cathedral glass set in lead. There are two entrances, one on each side. The one on the right-hand side is the main entrance to the hall, 6 ft. wide. The left-hand entrance is to the school. Two shops are provided between the two entrances. The hall is 36 ft. wide and 76 ft. long. The seats are all semi-circular and rise one above another. The orchestra on each side of the organ occupies an elevated position facing the congregation. The organ has been built and supplied by Messrs. Wadsworth Bros., of Manchester. The pulpit, seats, &c., are of pine. The hall will accommodate about 600 persons. The schoolroom will hold some 400 children. There are three classrooms, a kitchen, and a minister's vestry. The buildings are warmed with hot water, and the lighting will be by electric light. The architect is Mr. T. Wonnacott, and the contractors were Messrs. T. Quick & Son.

UNITARIAN CHURCH, ABERDEEN.—A new Unitarian church is to be erected at Aberdeen in Skene-street, at its junction with Rosemount-viaduct. The architects are Messrs. D. & R. J. M'Millan, Aberdeen. The cost will be about 5,000*l*.

FIFE AND KINROSS ASYLUM.—A meeting of the Lunacy Board of Fife and Kinross was held in Cupar on the 11th inst. The committee had before them plans prepared by Mr. Gillespie, architect, for the proposed extensions at the asylum. The Chairman explained that the general idea was to provide another 100 beds. The expense of the additions and alterations was roughly estimated at from 10,000*l*. to 11,000*l*. The committee required the authority of the Board to allow the architect to make detailed plans and specifications and estimates of the cost, which would be submitted to the Board. After some discussion, it was agreed that scheme C should be adopted, and it was remitted to the committee to get Mr. Gillespie to prepare plans and specifications, with estimates, and submit these to the General Board of Lunacy and also to the Board for approval.

ENLARGED PREMISES FOR THE SHEFFIELD CLUB.—At the annual meeting on the 11th inst. of the members of the Sheffield Club it was resolved to enlarge the premises, and bring the building more in harmony with modern ideas. The intention is to build a wing on the new site, and to remodel the whole of the present premises. The plans provide for a coffee-room, new billiard-room, members' bedrooms, elevator, and other accommodation. A competition for the new buildings and alterations recently took place among Sheffield architects, with the result that Mr. J. W. Connon, of Leeds, who was appointed assessor, awarded first place to Mr. J. I. Potter, of Norfolk-street.

LIBRARY, WOLVERHAMPTON.—Wolverhampton's newest municipal building, the Jubilee Free Library, situate at the corner of Cleveland-road and Garrick-street, the opening of which we briefly mentioned last week, has been designed by Mr. H. T. Hare, of London, and erected by Messrs. Wilcock, of Wolverhampton. The site of the structure was formerly occupied by the Theatre Royal, which, after the erection of the Grand Theatre in Lichfield-street, was for many years vacant. The walls are of red brick with terra-cotta mouldings and dressings, and the roof is covered with red tiles, but a considerable amount of ornamental work has been introduced in connexion with the main entrance, which has a triple arch and two doorways leading into a vestibule. On the left-hand side of the entrance hall is the magazine-room, 68 ft. long by 50 ft.

broad, the coved ceiling being supported by pillars with Corinthian capitals. Over a concrete floor has been placed a thick cork covering which will prevent any noise through people moving from one part of the room to another. Light is admitted through six arched windows on either side of the room, with two at the Hall-street end. The news-room is situated on the same floor, and is 50 ft. long by 45 ft. wide. The upper rooms are reached from the vestibule by means of a winding staircase, with polished Hopton Wood stone sides, and balustrade of the same material, which opens into another vestibule with ornamental lights from the ceiling. On the left-hand side is situated the lending library, which is of the same dimensions as the magazine-room. Light is here secured by means of double-arched skylights placed in the centre of the ceiling. Adjoining the lending library is the reference library. There the walls are panelled with oak, and the fittings are of the same material, while provision is made for the care of about 9,000 volumes, though in a room above will be placed the newspaper files and other books which are not so frequently asked for as those in the reference library proper. Special accommodation has been made for the chief librarian.

COLNE AND HOLME VALLEYS ISOLATION HOSPITAL.—On the 13th inst., in one of the rooms at the Huddersfield Union Offices, Mr. F. St. George Mivart, M.D., an Inspector appointed by the Local Government Board, held an inquiry into an application made to that Board for sanction to the borrowing by the West Riding County Council of 23,744*l*., for the erection by the Colne and Holme Valleys Joint Isolation Hospital Committee of an infectious diseases hospital at Meltham Moor. Mr. J. Berry, the architect, gave a description of the site and the proposed hospital, with the estimates of the cost. The site of the hospital is about one mile from Meltham Station, called Meltham Moor, and adjoins the public highway from Meltham to Slaithwaite and Marsden. The total area of the land acquired is 19a. 3r., and the area of the site intended to be used for hospital purposes is 7 acres. The height of the hospital above the sea level will be 790 ft. The hospital will consist of seven blocks of buildings: — 1, administration; 2, lodge and discharging-rooms; 3, isolation block for six beds; 4, scarlet fever pavilion with two separation wards for sixteen beds; 5, another scarlet fever pavilion, without separation wards, for fourteen beds; 6, typhoid fever pavilion for fourteen beds; 7, laundry, disinfecting-rooms, stable, engine and boiler-house, and mortuary. There will be a porter's lodge near the entrance gates. The isolation block will contain two bed wards, two single bed wards, and two nurses' duty rooms. There will be an open verandah in front of each section, and leading off it will be the water-closets and slop sinks, and a movable bath will be placed under each verandah. The total space of the wards will be 2,028 cubic feet, and will give 150 sq. ft. per bed. Each of the scarlet fever pavilions will have two wards, each with eight beds for females, two other wards each with six beds for males, and there will be two separation wards in one pavilion only. The nurses' duty rooms or ward kitchen will be placed in the centre of the building, and will have four fixed windows allowing complete observation of the four wards. The convalescent-room will be on the first floor in the centre of the pavilion, over the entrance passage and nurses' duty room, and will be approached by a stone staircase from the front entrance. The bath-rooms, water-closets, and slop sinks will be placed at each end of the wards, cut off by a cross ventilating lobby. An open verandah will run along the south-east front of each pavilion. The wards in the scarlet fever pavilion will be of the same total area as those of the isolation block. The typhoid fever pavilion will have six beds in the female ward, six in the male ward, and one bed each in the two separation wards, and the nurses' duty room will be similar to those in the scarlet fever pavilions. There will be no convalescent room to this pavilion. One movable bath will be provided, and the water-closets and slop sinks will be placed at each end of the wards. The total area of the pavilion will be the same as in the other pavilions. The laundry block contains wash-house, laundry, drying stove, receiving-room, disinfecting-rooms, van shed, ambulance, stable, harness-room, covered yard, coal place, engine and boiler house, accumulator-room, long chimney, mortuary, and viewing-room. All the larger wards will be heated by means of open double-fronted stoves placed in the centre of the rooms, and the smaller wards will have open fireplaces. The bathrooms will be heated by small radiators. Fresh air inlets will be provided behind each bed; all the windows will be double hung with sliding sashes, and fanlight made to fall inwards above. Ventilating shafts will be fixed in the ceilings of each ward, and connected to extract ventilators on the roof. All the wards will have 1 square foot of window to every 66 cubic feet of space. All the baths in the pavilions will be supplied with hot water obtained from steam-heated calorifiers.

ADDITIONS TO HOSPITAL, BUCKNALL, STAFFORDSHIRE.—Additions to the infectious diseases hospital of the Hanley, Stoke, and Fenton Joint Hospital Board were opened at Bucknall on the 6th inst. These are the third extensions which have taken place during the last six years, and they include a new eighteen-bed pavilion, with separate wards and annexes; a large addition to the administrative block; a power block, containing steam boiler, engine, dynamo, accumulators, &c., and chimney shaft 60 ft. high; additions and extensive alterations to the laundry block, with modern disinfecting station; new stabling and ambulance house block. The total cost has been about 10,500*l*. The whole of the work has been carried out by the various contractors to the designs of and under the superintendence of Mr. Elijah Jones, architect, Hanley. The eighteen-bed pavilion is planned as per the Local Government Board's requirements for eighteen beds, with 2,028 cubic ft. of air space to each, but like all other buildings on the site, it is furnished for double the number allowed, viz., thirty-six—half the number being children's cots. It has a central entrance leading into a hall, which is heated by a radiator connected with the bath boiler at the back of the range in the nurses' duty-room. Larder and coal place are provided on either side of entrance. In front, on entering, is the nurses' duty-room. Four inspection windows are provided, looking into both wards, and also into separation wards. To the right and left are the principal wards, each being 48 ft. by 26 ft. Entering out of these are the separation wards. At the end of each ward is the annexe, approached by a disconnecting and ventilating lobby (which cuts off this part of the building from the main wards). It contains two water-closets, nurses' slop-sink, bath-room with lavatories, and a small storeroom. The whole of the floors to wards, separation wards, nurses' duty-room and bathrooms, are laid with maple floorboards, polished. The floors of the vestibule, corridors, and annexes, except the bath-rooms, are laid with terrazzo, and the walls are covered with tiles. The painted woodwork to interior and ceiling is finished in "Ripolin." The large wards are heated with Shorland's patent down-draught hot-air faience stoves (two to each ward), and the separation wards are heated with their patent Manchester grates. Behind each bed is fixed in the wall, near the floor, a patent inlet to admit the air, with as little draught as possible. Air inlets are also fixed in the walls between windows, with Boyle's brackets; also outlets above these in the wall at the ceiling level. In addition to these outlets, grids are fixed in the ceiling connected with air-tight wood channels or troughs, which are in turn connected with Boyle's air-pump ventilators on the roof. The ward windows also assist the ventilation. The laundry block has been almost remodelled, as well as enlarged; it is now a dual system, containing patients' wash-house, staff wash-house, ironing-room, hot-air drying closets, disinfection station, and mortuary. The machinery has been supplied by Messrs. Summerscale & Sons, Keighley. Electric light is provided in the building. The stabling block is built round the coach-house erected for ambulance, and contains now spaces for two ambulances, two-stall stable, loose box, harness-room, loft, and a room which could be used as a bedroom. A large addition has been made to the administrative block. The chief features are the entrance-hall and new main staircase, servants' hall, housemaids' pantry, larder, ten bedrooms, nurses' bathroom, sitting-room, lavatory, water-closet, and linen stores. The finishing of the premises is somewhat similar in character to the eighteen-bed pavilion, the walls having tiled dado, with plaster above instead of all tiling. In connexion with these extensions, Messrs. H. P. Embrey & Co. have been the contractors for the buildings, and included in their contract are the Marsden Tile Co., Burnlem, who have executed the whole of the tiling to walls, dadoes, hearths, &c.; Messrs. Diespeker, London, the terrazzo paving; Messrs. George Howson & Sons, Hanley, the whole of the baths, water-closets, slopsinks, lavatories, and sanitary fittings; Messrs. Shorlands, Manchester, the faience stoves and Manchester grates; Messrs. Boyle & Sons, London, the roof ventilators and inlets, except those behind the beds, which are Messrs. Ellison's; Messrs Lockerbie & Wilkinson, Birmingham, the locks, door fasteners, and ventilating hoppers. Other separate contracts are by:—Mr. E. Malkin, Hanley, for the furniture; Messrs. Holgate & Small, Stoke, for the bedsteads and ironmongery; Messrs. Summerscale & Sons, Keighley, for the laundry machinery; Messrs. Manlove & Alliot, Nottingham, the disinfector; Messrs. Blackburn, Starling, & Co., Nottingham and Hanley, the engine, dynamo, accumulators (Chloride Co.), and the electrical plant; grates, chimney-pieces, and ripolin, Mr. J. Collings, Hanley; wrought-iron dog grate, by Mr. W. Durose, of Tunstall.

MANCHESTER CUSTOMS OFFICES.—For a considerable time past the Customs authorities at Manchester have pressed upon the Commissioner of His Majesty's Board of Works the necessity of having a new custom house in Manchester to meet the increasing volumes of trade in that city and its vicinity. The matter has now taken tangible shape. Mr. Tanner, on behalf of the Commissioner of Works and Public Buildings, has intimated that the Department is prepared to receive tenders for the erection of the new custom house at Manchester. Messrs. J. L. Lee & Son, architects, of Craven-street, Charing Cross, London, have prepared bills of quantities, and forms of tender may be obtained from them. Tenders may be delivered up to March 3.—*Manchester Courier.*

CORN, &C., EXCHANGE, MANCHESTER.—The new Corn, Grocery, and Produce Exchange, which is being built upon the area bounded by Hanging-ditch, Cathedral-street, and Fennel-street, is approaching completion. The general plan of the exterior of the new exchange is a building of four to six stories, with an average depth of 40 ft. back from the street, the exchange itself occupying the inner triangle thus formed. The site presented considerable difficulties, for it was necessary to preserve the light to the lower stories of the street buildings at the back, and at the same time to secure a simple and symmetrical roof over the exchange. It was found that these two demands could only be satisfied by adopting a form of roof which had its main lines parallel with the three streets. Any regular geometrical form was out of the question. The result is an irregular triangle supporting a circular dome. The main roof is carried on an arcade, parallel with the walls at a distance of about 18 ft., and this space is covered by a coved roof, brought down so far and in such a way that the first floor offices have ample direct light. The arcade supporting the roof is of columns 24 ft. high and arches rising to a height of 36 ft. At a height of 44 ft. is a cornice or balcony, projecting 4 ft., with massive consoles underneath. From this point springs a cove, the three sides meeting in a triangle (66 ft. from the floor), and upon this rests the central dome, which is 30 ft. in diameter. The constructional parts are of steel. The building surrounding the central hall is of various heights, from four stories and a basement in Fennel-street to six stories, basement, and sub-basement (or eight in all) in Cathedral-street. The whole of the frontage is faced with dressed Yorkshire stone. The basements and sub-basements of the building will be almost entirely taken up with the produce trades, and some of the ground-floor premises are also being let as warehouses for these trades. When completed, the whole building will contain 350 warehouses, shops, and offices, besides an hotel of forty rooms. The character of the general scheme has been maintained inside the building as well as outside. The corridors and staircases are airy and well finished in tiles and mosaic, and all the floors are fireproof. For artificial lighting electricity has been employed, and a system of heating by means of steam has been provided. The architects for the new buildings are Messrs. Potts, Son, & Hennings, and the general contractors are Messrs. Robert Neill & Sons.—*Manchester Guardian.*

THE NAZARETH HOME, LANCASTER.—A new home in Ashton-road, Lancaster, has been erected by the Order of the Sisters of Nazareth, whose headquarters are at Hammersmith, London. Provision is made for 250 children, but as far as the accommodation will allow the beneficence of the Order will be extended to a few old men and aged women. It is a home for destitute children, strictly speaking for girls, as boys are provided for by the Order at Ditton Hall, in the South. The new buildings are approached by a drive through an entrance gateway situated in Ashton-road. The main front, which faces south-east, has a projecting gable flanked by angle buttresses and having a niche over the doorway containing the figure of St. Joseph; above the niche is an oriel window. At each end of the main front are projecting wide gables, with two stone dormers between on each side of the entrance gable. At the north-east end is a projecting octagonal-ended apse to the chapel, and at the south-west end is a secondary staircase gabled against the main block. Entering through the vestibule, 10 ft. wide, a corridor, 8 ft. wide, is reached, which runs longitudinally through the building. On one side are the chapel and sacristy, sitting-room, schoolroom, and workroom; on the other a large dayroom, sisters' dining-room and pantry, main staircase, and men's sitting-room and dormitory. Corridors also branch off to the kitchen wing and also to the offices and bathroom blocks and garden entrances. The kitchen and scullery are 28 ft. and 21 ft. 6 in. long by 19 ft. wide respectively, and each have access to a corridor from out of which open stores. The first floor is divided by similar corridors to the ground floor, with women's and sisters' dormitory, women's refectory, linen room, guest room, sisters' day room, &c. On the second floor the same scheme of main corridors is repeated, with the various dormitories, babies' day room, children's clothes store, bathroom, &c., opening out of the same, and the offices are in cut-off blocks, one to each side. The basement contains play room, lavatory, and changing-rooms, and various cellars, and heating-chamber. The kitchen wing is all one story. The buildings are of stone lined with brick, and the roofs are covered with green slates. The corridors have tiled floors of fireproof construction. The staircases of stone are also fireproof, and with glazed brick dados running round both staircases and corridors. The laundry and washhouse block, which is a detached block, standing some distance to the north-east of the main building, is a one-story building, with a receiving-room, washhouse, and laundry, together with stable, loft, and piggery. The buildings are in the Tudor style, with mullioned and transomed windows. The work has been carried out by the following contractors:—Masonry

B. Graham & Sons, Huddersfield; the carpenters' work was mainly executed by Mr. T. Hird, of Keighley, who was the original contractor, and the joinery has been done by Messrs. J. Hatch & Sons, of Lancaster; slaters' work by Messrs. Hill & Nelson, of Morecambe; plasterers' work by Mr. O. Lister, Ilkey; plumbers' work and electric lighting by Messrs. Calvert & Heald, of Lancaster; heating by Messrs. Dilworth & Carr, of Preston; cooking appliances by Messrs. Newton, Chambers, & Co., of Manchester; and laundry fittings by Messrs. Bradford & Co., Salford. The buildings have been erected from designs by and under the superintendence of Messrs. Austin & Paley, of Lancaster. The outlay on the new home has been 15,000*l.*

TOWN HALL, THETFORD.—On the 6th inst. Thetford new Town Hall was thrown open to the inspection of the burgesses and their wives. The new building will cost about 10,000*l.* It consists of basement, fire-engine house, coal store, kitchen, scullery, Mayor's parlour, large hall, council chamber, magistrates' room, county court, entrance hall, and grand jury chamber. A feature is the stone porch, with the flight of York stone steps. The stonework throughout is of Ketton stone, and the outside brickwork has been done in wuite Cossey bricks. The entrance hall is 10 ft. wide, with a height of 14 ft. The outer doors are panelled oak, and there are double doors opening out of it to the large hall, and the County Court. The large hall is 52 ft. long by 27 ft. wide, with a height of 23 ft. 9 in. to the crown of the ceiling. The floor is carried by steel girders and wood joists, and consists of a 1-in. oak floor laid on a ¾-in. deal floor. At one end there is a gallery 27 ft. long by 8 ft. wide, with ornamental curved iron front, and at the other the statue of Justice (date 1709) is placed in a decorated niche. The walls are finished in plaster with Duresco colouring. The ceiling, which forms an elliptical arch, is spaced out in panels. There are three central electric light pendants, as well as wall brackets, which latter are only intended for occasional use; arrangements have been made to admit of movable electric lights upon the platform when the room is used for public meetings. This room will be warmed by four hot-water radiators. The county court is 30 ft. long by 27 ft. wide, with a height of 14 ft. 7 in. The floor is of wood blocks laid on concrete, and the room is heated with hot water pipes laid in trenches. The council chamber is 27 ft. long by 19 ft. 6 in. wide, with a height of 14 ft. 2 in., with circular-headed windows on two sides. The magistrates' room is 14 ft. by 12 ft. This will be used by the magistrates as a retiring-room, and will also form a private room for the recorder and county court judge when their courts are in session. At this end of the building there is also a cloak room and lavatory fitted with hot and cold water. The building, which is Queen Anne in style, is lit throughout with the electric light, and is heated with hot water. Mr. H. J. Green, of Norwich, has been the architect for the whole of the work, and Mr. C. W. Bullen has acted as clerk of the works. Messrs. E. Willmott & Sons, of Cambridge, have been the principal contractors for the building, and the sub-contractors were:—Stonework, Messrs. R. Hall & Son, Thetford; plastering, Mr. W. G. Croteh, Norwich; ironwork and water fittings, Messrs. Barnes & Pye, Norwich; clock, Mr. W. H. Harris, Thetford; County Court fittings, Messrs. Trevor, Page, & Co., Norwich; mosaic work, Mr. J. F. Ebner, London; electric lighting, Messrs. D. Brown & Co., Newcastle-on-Tyne; ventilating pipes and details, Exors. of late W. Clarke, Thetford.

INFIRMARY, ROCHDALE.—A few days ago a new workhouse infirmary, which has just been completed at a cost of 26,000*l.*, was opened at Rochdale. It stands on the high ground behind the Union Workhouse at Dearnley, about two miles and a half from Rochdale. It consists of a centre block, with accommodation for doctor and matron, administrative block behind the same, having receiving-rooms, dispensary, and operating-room. Over the same, accommodation for nurses and staff, and behind this kitchen offices. On either side is a pavilion, two stories high, exactly similar, one for males and one for females. On each floor is the general ward for twenty-eight patients, dayroom, small wards for one, two, four, and eight patients, nurses' duty-room, &c. The total number of beds for patients is 172. The architect is Mr. Butterworth.

BAPTIST SCHOOL, WYCOMBE.—On the 6th inst. a new Baptist school was opened at Wycombe, Bucks. The school is an instalment of a larger undertaking, viz., the erection of a chapel, which it is proposed to carry out in the future, in accordance with designs prepared by Mr. T. Thurlow, architect, of High Wycombe, from whose plans the schoolroom has been built. The school occupies a site at the junction of Oakridge and Jubilee roads, with direct and near access from the main road to Oxford. Accommodation has been provided for 250 persons, while there are also classrooms. The work of construction has been carried out by Mr. J. T. Harris.

NEW MUNICIPAL BUILDINGS AT LLANDUDNO.—At Llandudno on the 10th inst. the new municipal buildings were opened. The site was given by Lord Mostyn in commemoration of the completion of the sixtieth year of the reign of Queen Victoria. The buildings were designed by Messrs. Silcock & Reay, of Bath, and the cost of construction will amount to about 23,000*l.*

HOTEL, BROOMHILL, NORTHUMBERLAND.—The Grey Arms Hotel was opened recently at Broomhill. This is the first of the houses built under Earl Grey's Public-house Trust movement, the leading features of which are that the manager has no interest in the sale of liquor, but has an inducement to sell food and liquid refreshments of a non-intoxicating nature, and that all the surplus profits are to be spent by the Trust for the benefit of the district in which the house is located. The hotel is built of red brick, with Birling stone dressings and green Westmorland slates. There are on the road front two doorways, one leading into the hotel generally and the other into the bar. Entering at the former an entrance hall gives access on the left to the dining-room and on the right to the bar parlour and billiard-room. The bar parlour is furnished with fixed upholstered seating in three bays formed by the pillars supporting the main wall of the front, and is floored with mosaic. The kitchen department lying behind the dining-room is on an ample scale. The bar is a well-lighted apartment, lined with enamelled tiles and fitted with counter, showcases, seats and panelling, in green stained woodwork. Upstairs, over the dining-room, is a tearoom, served by a lift from the kitchen. The two rooms adjoining this are so arranged that they may be converted into one on any occasion demanding a large room. A suite of bedrooms for the visitors and bedrooms for the staff—with bath and storerooms—complete the upstairs accommodation. A large cellar occupies the whole of the basement below the bar parlour and bar. Behind the hotel is the stable block in process of erection. The chief contract has been carried out by Messrs. R. & G. Brown, of Amble, and sub-contracts for specialists' work by the following:—Hot-water heating, Messrs. Emley & Sons, of Newcastle; wall tiling by Messrs. Henry Walker & Sons, of Newcastle; mosaic flooring, by Messrs. Diespeker & Co., of London; lifts, by Messrs. Waygood & Co., of London; counters and bar fittings, &c., by Messrs. T. Robertson & Sons, of Alnwick; acetylene gas installation, by the British Illuminating Co., of Newcastle. The heraldic painting on the swinging sign is by Messrs. Atkinson & Philipson, of Newcastle. The hotel was designed by Mr. Geo. Reavell, jun., of Alnwick, and the work has been carried out under his superintendence.

COUNTY SCHOOL, DENBIGH.—On the 13th inst. the foundation stones were laid for a new county intermediate school for boys at Denbigh, on Rhoffty Crown, near to the girls' and infants' board schools. The classroom accommodation provided is for eighty boys. There is also a workshop for eighteen boys, and a chemical laboratory for twenty students, and a science lecture classroom to accommodate forty. The building will be of limestone from the Graig Quarry close at hand. The work is being carried out from the designs and under the superintendence of Mr. James Hughes, architect, Denbigh. The contract has been let to Mr. G. H. Marshall, of West Smethwick.

BUSINESS PREMISES, SHEFFIELD.—Shops and offices are about to be erected at the corner of Angel-street and King-street, Sheffield, for the Corporation. The buildings will consist of four shops, with basements suitable for showrooms or workshops, and with a yard at the back. There are four upper floors of offices. The building is to be of Huddersfield stone and French Renaissance in style. The office corridors and staircase are to have mosaic floors and tile walls, and the building throughout is to have fireproof floors, covered with wood blocks. The architects are Messrs. Gibbs & Flockton.

WHOLESALE MARKET, LEICESTER.—On the 13th inst. Councillor Hilton opened the new wholesale market in Halford-street, which has been erected at a cost of 60,000*l.* The market contains at the Halford-street end a building having an office set apart for the officials of the market, offices for business purposes, lock-up shops and stores. The building is divided on the front below the first floor by a large central archway and road, for vegetable carts and waggons, to be used as an entrance only. On either side of the archway entrance the offices have their entrances direct from the street, while access is also obtained through doorways leading direct from the market. At each end of this building a lock-up shop is placed, and over the same, on a mezzanine floor, storerooms are provided. The superintendent's office and committee-room are situated on the first floor, in a central position overlooking the market. The weights and measures inspector will use one of the lock-up shops. Lavatories and conveniences are situated on the mezzanine floor. The whole of the other portion of the site is to be used by the wholesale vegetable and fish merchants. A roadway, 25 ft. wide, runs through the market, and at the sides of this twenty-three vegetable stalls are placed, also twenty-one fish stalls, with offices over, each pair being approached by a staircase. The stalls between the market roadway and Yeoman-street have double doors, so that goods can be delivered from the latter as well as the former. The vegetable stalls are all fitted with collapsible gates. The roof runs at right angles to the roadway. A fish washing-room for the hawkers is provided near to the large exit in Yeoman-street. Between the main walls of this portion of the building, which is carried on an arcade of elliptical arches and piers, is a 51-ft. steel-spanned roof covered with pantiles, and having light introduced on the north side. The floor which covers the basement is constructed with rolled steel joists and girders, supported by steel stanchions. A refreshment-room for the stallholders' use is placed on the first floor over the trolley way. On either side of the large exit in Yeoman-street there are conveniences for stallholders and buyers. The total capacity of the cold stores, situated in the basement, is 32,500 ft. The engine-room contains a 32-h.p. Crossley gas-engine. The whole of the market is lighted by electricity. All the offices contain gas-stoves as the heating medium. Most of the front building is faced with terra-cotta, having a semi-glazed plinth. The dressings of the other external portions of the buildings and portions of the interior are of the same material. The external facings of the market proper are Woodville sand-faced bricks, and the internal facings are of Whitwick white bricks. The roof of the front building is covered with Broseley tiles, while the whole of the other building is covered with pantiles and glazing. All the large archways are fitted with folding collapsible gates, with decorative wrought-iron scroll-work over. The roadway is formed of asphalt, and the stalls and standings have been laid with granolithic concrete. The lobbies of the front building are laid with Roman and Venetian marble mosaic. Mr. Walter Brand was the architect, Mr. Thomas Herbert the builder, and Mr. W. C. Lee the clerk of the works.

SANITARY AND ENGINEERING NEWS.

THE NEW BERMUDA FLOATING DOCK.—There has just been launched the great floating dock which has been built to the order of the Admiralty by Messrs. C. S. Swan & Hunter, of Wallsend-on-Tyne. The structure is 545 ft. long and the side walls are 53 ft. 3 in. high. The general shape in cross section is that of a letter U, but on the outside the rounded bottom is square, so that the exterior outline is rectangular like a barge. The width between the walls is 100 ft. clear, and, as the walls themselves are over 13 ft. across, the total width of the structure must be about 130 ft. The dock is capable of lifting out of the water a ship of 17,500 tons in weight and drawing 32 ft. of water. The dock is intended to take the place of the existing structure of the same kind now at Bermuda. The price of the dock has been stated to be 230,000*l.* The new dock has been built from the plans of Messrs. Clark & Standfield, of Westminster. As it has no end gates it will take ships of the greatest length within its lifting capacity as to weight. Its first duty is to lift line-of-battle ships of the first class of about 400 ft. long and 15,000 tons displacement, which will have a bearing length on the keel blocks of 343 ft. The dock consists of five chief parts. They comprise three pontoons, which form the main lifting portion of the dock. There are the two side walls, which are chiefly designed to afford stability, although they afford a certain amount of lifting power. The centre pontoon is 300 ft. long and is rectangular in shape, whilst the two end pontoons, which may be described as the bow and stern, have each a length of 120 ft., of which a portion is formed so as to afford a somewhat bluff bow. This will make the dock much easier to tow across the sea. What are known as the altars of a graving dock are formed in the side walls so as to facilitate shoring-up when a ship is docked. For docking armour-clad ships special provision has been made for supporting the belt by working in a strong channel to take the heels of the vertical shores. The side walls have in them two large openings by which light and air are more readily admitted to the bottom of the dock. The pontoons are divided into forty chambers, and the side walls have sixteen divisions in all. Each of these divisions has its separate suction pipe leading to the pumping machinery by which it can be emptied. Very complete provision is made for rendering the pumping arrangements interchangeable. There are four 18 in. centrifugal pumps placed in each wall, together with their motive machinery and boilers for generating steam. The working of the whole of the arrangements is carried on from a central position at the top of each tower. There are the usual warping bollards, capstans, fairleads, &c., as well as an electric light installation. There are also travelling and swinging electric cranes, which are driven by a separate electric machinery. Both the lighting and lifting installations are, however, interchangeable.—*Times.*

THE LONGTOWN WATER SCHEME.—The Longtown District Council, having on hand a scheme for the supply of two rural parishes, including the village of Longtown, with water, at an estimated cost of 17,000*l.*, decided recently to accept the tender of Messrs. Drummond, Dumfries, to do the work for 10,317*l.* Messrs. Drummond declined to sign the conditions, on the ground that while the specifications on which the contract was based provided that the pipes should be "of even thickness and true bore throughout," the conditions stated the specific way in which the pipes ought to be cast, viz., "vertically cast, socket downwards, in dry sand." The contractors' contention was that the ordinary trade reading of the specifications was that

the pipes should be cast on the slope, and that if the conditions were insisted upon their tender would have to be increased by 1,793*l.* This made their tender 522*l.* higher than another which had been passed by. They intimated their willingness to withdraw from the contract provided that their expenses up to date and the claims of founders, who had refused other work in order to fulfil Messrs. Drummond's order, were paid by the Council. The Council's engineer expressed the opinion, which he said was supported by five of the firms who had contracted for the work, that the trade reading of the clause "of even thickness and true bore throughout," was that the pipes should be vertically cast, as this was the only means of ensuring even thickness and true bore. The Council had accordingly offered to make the condition to read the same as the specification, but had received no acceptance of the altered conditions from Messrs. Drummond. The Council accordingly decided to enter into negotiations with the firm whose tender was next on the list, viz., Messrs. Brebner & Co., Edinburgh. They had tendered to do the work for 11,588*l.*

SOUTH WEST INDIA DOCK EXTENSION. — The new entrance lock to the South West India Dock was formally opened on the 12th inst. In order to meet the growing demand for more accommodation for large vessels in the Port of London, the directors of the company have for the last two years been carrying out extensive alterations and new works at the eastern river entrance to the South West India Dock. These works have just been completed, and vessels 450 ft. long and of a carrying capacity of 6,000 tons will be able to enter the dock by the new lock. The dock is now, with the exception of Tilbury, the deepest in London, having a depth of 29 ft. With its basin it has an area of 32 acres, and the quay walls are of sufficient length to accommodate twelve ships each 450 ft. long, in addition to a few smaller vessels. The length of the old entrance lock has been increased from 300 ft. to 480 ft., while the original depth of 27 ft. on the sill in the centre, reduced to 24 ft. at the sides of the invert, has been increased to 29 ft. on the sill and invert. In order to carry out the work the water was excluded from the site by means of a timber caisson across the lock at the river end and a semicircular dam in the basin. The extra pair of gates required for the extension were obtained from another part of the dock where they were no longer required. As the mud in the docks causes great inconvenience in working the gates, iron pipes connected with the sluice culverts have been embedded in the concrete of the new gate platform, so that the act of lowering the water in the lock draws away the mud from the roller paths. The sluices are in duplicate, one set being worked by hydraulic power, and the other by hand, in case of a breakdown. In addition to the reconstruction of the lock, a sewer has been constructed under the lock for the London County Council to carry the drainage of the Isle of Dogs, and to replace the old sewer in the bed of the river, which was in a rather dangerous position across the entrances to several docks. The cost of the works, including the sewer, has been about 52,000*l.* The design and carrying out of the works were entrusted to the company's late engineer-in-chief, Mr. H. C. Baggallay, and the contract was let to Messrs. C. H Walker & Co., of Westminster.

LEEDS NEW WATERWORKS.—A description of the Leeds waterworks, with special reference to the scheme recently sanctioned by Parliament for the extension of the undertaking, was the subject which engaged the attention of a meeting of the Yorkshire College Engineering Society on the 10th inst., the lecturer being Mr. E. J. Silcock, M.Inst.C.E., of Leeds. The lecturer, whose remarks were illustrated by maps and diagrams, reminded his audience that prior to 1837 the water supply of the city was pumped from the river Aire in the neighbourhood of Leeds Bridge; and a water-wheel, the framework of which was still in existence, was used to develop the necessary power for the distribution of the water to the population. It was hardly necessary, he thought, to say that the source from which this water was obtained was now, and had for some time been, totally unfit for the purpose of drinking. Proceeding, he described the formation of the Leeds Water Company, and the subsequent taking over of the works by the Corporation in 1852. He also described in some detail the extension of the works in the Washburn Valley, the drainage area of which, he said, was 22,000 acres. The area above the embankment of the Swinsty reservoir, from which the supply of Leeds was taken, was 17,047 acres: the available supply of water from the valley being 18,500,000 gallons per day. At the present time the consumption of water in Leeds was at the rate of 16,000,000 gallons per day, and it was the nearness with which the actual consumption approached the available supply that rendered it necessary for the Corporation to secure powers for the construction of additional storage reservoirs in the valleys of the Burn and the Laver. The present waterworks of the Leeds Corporation in the Washburn Valley were surrounded on the north and west by the gathering grounds of Bradford, Yeadon, Shipley, and other towns; while in the valley of the Nidd the ground was also occupied by the Bradford Corporation, so that, excluding the ground already occupied by existing or projected waterworks, there remained no area which could be utilised for the purpose of collecting water on any scale at all commensurate with the requirements of the city other than that in the valleys of the Burn, the Laver and the Skell. In estimating the quantity of water required, a consumption of 40 gallons per head per day was fixed upon as being probable within a short time. The present normal consumption in the country was 20 gallons per head per day, but Leeds was considerably above the normal standard, and the rate was increasing by 2½ per cent. per annum. The rate of increase in the consumption during the past decade in Leeds had been 16·75 per cent. while that in all other county boroughs outside the London area was only 13·25 per cent. The problem to be faced was how to double the present supply of 18½ million gallons per day, and it was found that the valleys of the Burn, the Laver, and the Skell would provide 21·4 million gallons. Harrogate, however, secured about 3,000 acres of the area, representing two million gallons, and owing to the opposition of the riparian owners, and particularly of Lord Ripon, the projected extensions in the Skell Valley were abandoned, with the net result that the increased supply for Leeds had been reduced to 15·6 million gallons per day. This would be collected in three reservoirs in the Burn Valley, known as the Colsterdale, the Leighton, and the Healey reservoirs, with a total capacity of 4,086 million gallons; and two reservoirs in the Laver Valley, known as Carlsmoor and Laverton reservoirs, with a capacity of 1,555 million gallons. These reservoirs, said the lecturer, would discharge into the Swinsty reservoir by means of iron pipe aqueducts and a tunnel passing through the ridge dividing the watersheds of the Nidd and the Wharfe, and entering the Swinsty reservoir at a point 10 ft. above the present top-water line. Having dealt with details of construction, the lecturer concluded by referring to the cost of the undertaking, the original estimate for which amounted to two and a half millions sterling, a figure which, for the modified scheme, has been reduced to 2,200,000*l.*

FOREIGN.

FRANCE.—M. Girault, the architect of the Petit Palais, has obtained the Lheureux prize; the decision which we have already suggested as the only right one.——M. Rodin's sculpture pavilion, which will be remembered at the 1900 Exhibition, has been rebuilt at Meudon.——The remains of a fortified Roman camp have been found at Mont Jouer, near Gucret, in the course of some excavations.——The town of Valence is about to open a competition for the laying out of a new public garden, to be called the "Parc Jouvet."——The exhibition of the works of Falguière is open at the Ecole des Beaux-Arts. One of the works exhibited, the "Combat des Bacchantes," has been purchased by the State for the Luxembourg Museum.——An establishment is to be opened shortly in the Boulevard des Italiens, near the Opéra Comique, for the sale of Sèvres porcelain manufactures.——M. Coutan has been commissioned to complete the bust of Mme. de Sévigné, commenced by the late M. Massoule, and which is intended for the small town of Grignan.——The jury in the competition opened by the town of Royau for the construction at Pontaillac of a sea-bathing establishment, has awarded a second premium to M. Piquard, of Epernay, and a third to MM. Sonès and Geslin, of Paris. The first premium was not awarded.——M. Paul Raffet, architect, of Tours, and a member of the Société Centrale des Architectes, is dead, at the age of fifty-five. He was a pupil of Constant-Dufeux, and the architect of important buildings in many of the Departments of France—mairies, private houses, villas, &c.——M. Louis Grolleron, known for twenty years as a military painter exclusively, is also dead, at the age of fifty-four. He began as a decorator, and became subsequently a pupil of M. Bonnat. His first pictures were works of *genre*, but in 1882 he obtained notice for his military painting "Combat at a Mill in the Outskirts of Paris, 1870," and subsequently devoted himself to this class of picture, for which he received awards and medals in several subsequent years, including a bronze medal of the Exhibition of 1900.

AUSTRALASIA.—An influential deputation, representing the Institute of Architects of New South Wales, has recently waited upon the Under Secretary for Works to impress upon the Government the desirability that designs for public buildings of a national character should, in future, be thrown open to competition, especially in the matter of the proposed model dwelling tenements to be erected in "The Rocks" area, Sydney. As matters stand at present in New South Wales, all the principal public buildings are carried out by the Government, and this means that all the designs come from one State office—the Government architect's branch of the Public Works Department.——The interior of the new stock exchange, a building recently opened in Pitt-street, Sydney, has been largely decorated with marble from the works of Messrs. Creak & Ford, and New South Wales marble generally is attracting considerable attention amongst architects in the colony.——A large hotel is now being erected opposite the railway station, Parramatta. It is to be of four stories, and to contain about forty rooms. The building will be divided into two parts, one for residential and the other for business purposes. The architect is Mr. Varney Parkes, of Sydney.

AUSTRIA-HUNGARY.—The Minister for Fine Arts in Vienna has invited sketches from Austrian architects for a Roman Catholic parish church, with a view to encourage the purely artistic aspects of the profession. The first and second premiums are 3,000 and 1,000 kronen respectively. It is not stated whether the accepted designs will be utilised or not, and we gather that the chief object is to encourage young architects to pay more attention to church architecture than they have been doing for the past few years.——The same Office has also invited designs for a reliquary from Austrian sculptors.——The Municipality of Buda-Pesth are about to erect a large monument to the memory of Kossuth, and the architectural bureau has thrown open the competition to all Hungarian sculptors. As this is to be an imposing architectural feature in the city, and as much as 13,000 kronen are offered as premiums to the three first-placed competitors, there will doubtless be a spirited competition.

UNITED STATES.—A movement is on foot in Boston to erect a new City Hall. It is estimated that by collecting together the various branches of the municipal offices, which are at present scattered over the city, one large building to house these departments would be much cheaper than by continuing the present method. The movement has the support of the Mayor and other influential citizens.——A new post-office, a court-house, and some other public buildings are to be erected in Cleveland, Ohio, and it is suggested that the buildings shall be so arranged as to improve the effect of all by suitable grouping. The Federal Government has pledged itself to do all that lies within its power to further the scheme, and has already purchased some of the land on the proposed site.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The Scottish Freestone Quarries Co. (Thornhill, Dumfriesshire) have appointed Mr J. Percy Day, of 3 Victoria-street, as their London agent for the sale of their "Closeburn Red Freestone," and Messrs. Kirkpatrick Bros., of Trafford Park, Manchester, as their agents for Lancashire. Messrs. Kirkpatrick will keep a large supply of the stone at their yard.——Mr. J. F. Fogerty and Mr. W. Clifford Parnell, architects, of Bournemouth, have entered into partnership under the style of "Fogerty & Parnell," at Belfast House, Gervis-place, Bournemouth, where the businesses of the late firms of Pinder & Fogerty (formerly Kemp-Welch & Pinder) and Pearce & Parnell (formerly Pearce & Offer) are now combined.——Mr. Edwin O. Sachs, architect, of 3, Waterloo-place, has taken into partnership Mr G. Spencer Hoffman, and the firm will practise under the style of Edwin O. Sachs & Hoffman.

THE "GARLING" PATENT SASH.—Messrs. Ellen & Co., of Fenchurch-street, have submitted to us a model of this patent, in which the sash is clipped by small metal balls in the exterior stiles working into holes in the window-frame, and pressed forward by springs behind them, which allow them to give and pass the holes as the sash is raised, until it is left in the desired position and the balls clip into the nearest holes and keep the sash in position. It of course does away with pulleys and weights, but it is rather noisy in lifting and lowering, owing to the rattling of the balls in passing the holes; and of course a spring is always an element of weakness in these contrivances; but the sash is made so that the springs can be repaired and replaced. It may answer for small sash windows. None of the contrivances of this class are applicable to large and heavy sash windows, which must have some balance weight to render them convenient and safe in working.

OVERCROWDED LONDON.—Before the Society of Arts, on the 12th inst., Mr. W. L. Madgen, Member of the Institution of Electrical Engineers, read a paper on "Industrial Redistribution" as the remedy for the overcrowding of large towns. London being taken as a crucial instance, Mr. Madgen declared against the proposals of the County Council on the ground that while conquering the space problem, it was creating a time problem. For how was a resident as Tottenham or Norbury to be whisked through the air to his work in the industrial quarters? Even if its most idealistic schemes were temporarily successful, London would become so much more attractive, and the population would increase faster than ever. The author's belief was that the best practical way to deal with the congestion of population was to aim at the creation of home colonies, in which factories and cottages, places of recreation, and so forth, may all grow up together. Looking through the directory you find lists of makers who could carry on their work more comfortably and efficiently elsewhere. Instead of the County Council's ideal of leaving the factory at Bermondsey, with the proprietor at Hampstead, the manager at Sydenham, the clerks at Forest Gate or Wimbledon, and the workmen at Tottenham or Norbury, all struggling twice a day to find room in railway carriages or tramcars, you might have business and homes within short walking distance, the staff better

housed, better fed, more comfortable, more able, and contented. London would have been happier if it had not been allowed to grow into one of the largest manufacturing towns in the world; if we had never been left to puzzle why Peek, Frean, & Co. should make biscuits at Bermondsey, while Reading was good enough for Huntley & Palmer; or why Cadbury's chocolate can find quarters at Bourneville, while Crosse & Blackwell's jams and pickles settle down in Soho; or why the London and South-Western Railway works should be at Nine Elms and the Great Eastern should employ 5,000 men at Stratford, while such places as Crewe and Swindon suit the purpose of other great railways? Mr. Justice Grantham had observed that "Doultons bring their clay from Dorsetshire and Cornwall, their coal from the Midlands, their salt from Cheshire, to London; they then use an enormous quantity of valuable and costly water, and having made their pipes and sanitary ware, send them back to the source of origin of their component parts, as well as to all parts of the world." He instanced also the great furniture factories and engineering works which are out of place in London. In Mr. Madgen's opinion the necessary conditions to bring about this change are the provision of cheap driving power for machinery, increased traffic facilities by light railways, the improvement of the canal system by the use of mechanical haulage, and the intelligent design of industrial building estates. The first three of these requisites will be supplied by electricity, but at the dawn of the twentieth century the Legislature still allows local authorities the power of veto over comprehensive electrical projects. There exists already a tendency for industry to scatter over a larger area and settle in smaller centres, and this movement should be encouraged by the breaking down of local obstruction. If the migration of industry once set in on an important scale, if the example of those few manufacturers who have within recent years settled on such districts as Bedford, Chelmsford, Lincoln, Loughborough, Newark, and Rugby be accelerated by cheap power supply and improved traffic facilities, no question need arise of compelling the factories to move away.

HISTORY OF ARCHITECTURE.—The first of a series of lectures on the "History of Architecture," by Mr. Hugh Stannus, F.R.I.B.A., was given in the Municipal School of Technology, Whitworth-street, Manchester, on the 12th inst. The lectures will be given every Wednesday evening until July 23rd, and the subject of architecture will be treated in three divisions: Ancient, Romanesque, and mediæval and modern architecture. On the 12th inst. the lecturer dealt with the evolution of remote Egyptian architecture, and dealt with the geography of the Nile Valley. He explained that the granite and stone blocks in the cliffs at the edge of the Nile Valley at Assouan were floated down. Timber being scarce, except the expensive cedar from Lebanon, they modelled their stonework on their own use of the branches of the palm. He showed how the cavet and torus mouldings were designed from the use of the palm branches in primitive structures. Views of the cliffs of rock, some 1,000 ft. high, were shown, and those of the Valley of the Tomb of Kings, the Necropolis of ancient Thebes. The evolution of the Egyptian column, as seen in the tombs and temples, was demonstrated as first square, then octagon, and so on, until finally the flat facets in the hexadecagon columns were fluted. The primitive use of maize stalks in bundles was the source of the ideas applied to architecture in stone. The favourite types of capitals were the lotus bud, the flower, drooping leaves, the Ptolemaic, and the Hat-Hor. At first the lotus flowers were tied round the tops of the pillars in rejoicings for a good inundation of the valley after which the lotus was most luxurious. The second type probably sprang from the flower of the papyrus. The third was only found in one temple, and was copied from the capitals in the Troad, Mesopotamia, and Asia Minor generally. The Ptolemaic was an Egyptian adaptation of the Corinthian. Very interesting, too, was the demonstration of the evolution of the lotus shaft or pillars. The lecturer then dealt with the national character of the people, the feature being their intense seriousness and their superstition. The next lecture will be on Egyptian remains. The course, of twenty lectures, is illustrated by lantern slides.—*Manchester Courier*.

ST. MARK'S COLLEGE, CHELSEA.—An appeal is made for subscriptions towards a sum of 5,000*l.* to meet the cost of proposed additional buildings—comprising new lecture-rooms, a workshop, a science laboratory, and improved accommodation for the resident staff—in order to place the institution in a condition of modern educational efficiency. The buildings, and grounds of about eleven acres, were purchased for, it is said, 9,000*l.*, as a training college by the National Society in 1840; Blore added the quadrangle some ten or twelve years afterwards. The house, formerly known as Stanley, or Stanley Grove, House, had been the home at intervals in 1815-40 of William Richard Hamilton, the virtuoso, who added an east wing for his collection of casts of the Elgin marbles; it had been occupied by Admiral Sir Charles Wager, Walpole's intimate friend, who died there May 24, 1743, and was buried in Westminster Abbey. The property was afterwards bought, in 1777, by Mary, Countess of Strathmore, who there cultivated many rare exotics. The house had been built at the end of the seventeenth century on the site of one built for himself by Sir Arthur Gorges, the friend of Spenser, whose widow sold it, together with some adjacent land known as the Brickills, in 1637, to their only daughter, the widow of Sir Robert Stanley, whose descendants lived there until the death of William Stanley in 1691.

THE LAND REGISTRY, LINCOLN'S INN FIELDS.—For the new buildings of the Registry the demolition has been begun of the block of houses and shops, Nos. 4, 5, 6, and 7, Serle-street, and Nos. 1, 2, and 2½, Portugal-street (north side). On April 1, 1892, the Middlesex Registry of Deeds, established by an Act passed in Queen Anne's reign, was incorporated with the Land Registry, of which the offices were transferred a few years ago from the terrace, Staple Inn, to Lincoln's Inn Fields. Consequently upon a considerable increase of the business of the Middlesex Registry additional space for it was obtained in September, 1899, by the conversion of the offices and courts vacated by the Official Referees in Portugal-street, where at No. 6 on the ground floor a large room has been fitted up for the inspection of ordnance maps in respect of the new compulsory registration of title to land, upon sale, in the City and County of London. Colonel F. P. Washington, late R.E., was appointed to the directorship of the map department.

YORKSHIRE FEDERATION OF BUILDING TRADES EMPLOYERS.—About 150 members of the Hull Branch of the Yorkshire Federation of Building Trades Employers attended the annual dinner at the Grosvenor Hotel, Hull, on the 13th inst., Mr. E. Good, the President, in the chair. Mr. T. Marsden, Vice-president, proposed the patriotic toast, coupled with the names of Mr. B. S. Jacobs and Mr. P. T. Runton, architects. Mr. J. Watson, surveyor (Hull), proposed "The National and County Federations." He said that trade throughout the country was at a low ebb, and the question arose how the difficulty would have to be met. He thought it would be very much to their advantage if, instead of decreasing wages, they directed their efforts to the weeding out of inferior workmen. They might also formulate a better system of apprenticeship. He was closely connected with a charity under which 300 fatherless children were apprenticed, and a considerable number of them belonged to the building trades. These children had the advantage of attending technical classes, and here he would emphasise the fact that the welfare of this country in future depended largely upon apprentices taking proper advantage of technical education.—Mr. J. Dawson, Vice-president of the Yorkshire Federation (Huddersfield), replied. He regretted the existing antagonism between capital and labour in the building trade. There was no necessity for it, and on the part of employers it was very much against their wish. With regard to the lowering of wages, the employers wanted to do what was right and fair, and if they had a good man they wanted to pay him a good wage. The Yorkshire Federation long ago passed a resolution asking its members as far as possible not to reduce wages, but to combat restrictions and interference with the employers' liberty of action, which was detrimental to the trade and absolutely un-English. If there was one body that was responsible more than another for the "go easy" principle, it was the Corporations, which employed their own workmen. If there was a gang, say, of fifty men, twenty-five of them would be idle, and that was a state of things which no private contractor could afford. He urged the young men present to stand by the Federation, and they would be able to stand up to the men face to face on their own ground. Mr. J. M. Dossor proposed "The Hull Branch," and the Chairman replied. Speeches were also delivered by Mr. F. Beilby, Alderman Larard, Councillor Scott, and others.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointments of Messrs. J. V. Snowdon and J. Owner as sanitary inspectors in Deptford, and of Mr. C. V. Nutley as sanitary inspector in Hammersmith.

THE ELECTRICAL FITTINGS CO.—On Wednesday afternoon last, by special invitation, we inspected the new showrooms of the Electrical Fittings Co., 38, Conduit-street, New Bond-street, W. A large variety of artistic fittings for electric lighting was shown, and all the ordinary accessories exhibited were of high-class workmanship.

CROYDON AND DISTRICT BUILDERS' FEDERATION.—The annual dinner of this Federation was held on the 18th inst., at the Greyhound Hotel, Croydon. The company present, numbering between seventy and eighty, included Messrs. Samuel Page (President), David W. Barker (Vice-President) in the chair, David Waller (Hon. Treasurer), Chas. Wall (President of the Institute of Builders of Great Britain), F. W. King (President of the London Master Builders' Association), and others. The loyal and patriotic toasts having been duly honoured, Mr. Charles Hursey, J.P., proposed the "Croydon and District Builders' Federation," and urged the need for Arbitration Boards to decide between builders and the various trade unions. The Chairman, in replying, spoke of the work of the Association during the past year, and said that the need of organisation was being more and more felt in the district. He invited those few local builders who still remained outside the Association to become members and still further strengthen the position of builders in the borough.—Mr. S. Page then proposed the "London Master Builders' Federation," and he coupled with the toast the name of Mr. W. F. King, who replied. Mr. King expressed a wish that in the near future the Croydon Association might be able to join hands with the other associations round London in all matters affecting the trade generally, although at the same time reserving to themselves the right to manage their local affairs, as they have hitherto done to advantage. "The Town and Trade of Croydon" and "The Visitors" were also toasted.

CAPITAL AND LABOUR.

DEPRESSION IN DUNDEE BUILDING TRADE.—Dundee building trade is at present experiencing a period of acute depression. Partially owing to general stagnation in the property market, and in a greater degree because of the recent severity of the weather, building operations in all branches have been practically at a standstill, and many tradesmen in consequence find themselves out of employment. Masons in many instances have been idle for three months, while slaters and others engaged in allied trades are in a somewhat similar position. It is the joinery trade, however, that has felt the pinch most acutely. Prior to the New Year holidays, a growing slackness manifested itself, ultimately resulting in wholesale dismissals of workmen from various establishments in the city. Last month the ranks of the unemployed were materially reduced by the removal of about thirty associated tradesmen to situations found for them in London. Since then, unfortunately, no improvement in trade has taken place, and additional men are being weekly suspended from the workshops.—*Dundee Advertiser*.

MAIDSTONE BUILDING TRADE DISPUTE.—The award of Mr. Askwith, Board of Trade arbitrator in the dispute between the masters and men engaged in the building trade in Maidstone, has been received. The masters had made a new rule to the effect that the men should commence work during the months of December and January at eight o'clock in the morning and continue working without any break till the dinner hour, and the arbitrator decides in their favour in regard to this. The men, however, succeed in their contention that the rate of pay for overtime should commence after an ordinary day's work instead of after a ten-hours day as proposed by the Masters' Building Association. The men also gain on a third though minor point in the dispute.

LEGAL.

APPEAL BY CONTRACTORS.

THE case of Laing, Wharton, & Down, Limited, *v.* Spiers & Pond, Limited, came before the Court of Appeal composed of the Master of the Rolls and Lord Justice Mathew on Saturday, the 15th inst., on the appeal of the plaintiffs from an order of Mr. Justice Jelf in chambers, dated January 23, 1902, affirming the order of the Master on a summons for directions whereby he ordered that the action should be stayed and referred under the terms of the contract to the engineer of the defendants.

Mr. Spencer Bower appeared as counsel for the appellants; and Mr. Montague Lush for the respondents.

It appeared from the statement of Mr. Spencer Bower that the action was brought by the plaintiffs, a firm of electrical engineers, to recover from the defendants 1,576*l.* 8*s.* 1*d.*, the balance they alleged to be due to them under two contracts, one in respect of work done in the electric lighting of the Hotel Metropole at Blackpool, and the other in respect of work done at the Granville Hotel, Ramsgate.

Lord Justice Mathew said he understood that the action was stayed by the Master and the Judge because of the arbitration clause in the contracts.

Mr. Spencer Bower said that was so, and what he wanted to get out of, if he could, was a reference to the engineer of the other party. He should ask their lordships to say that as there were points in dispute under the contract not referred to the defendants' engineer, the whole of the matters must be tried. If there were some matters referred to the arbitrator under the contract and some not, there was authority for saying that the Court would not order two fights, but would direct that the whole of the matters in dispute should be tried together in the ordinary way. He should ask the Court to say that the action should proceed, and then, if necessary, be referred to an official referee. The learned counsel went on to state that the plaintiff company went into liquidation before the work in question was completed, and the defendants alleged that the work was not properly done, and called in other contractors to complete it. Apart from the question of defective work, there were numerous questions with regard to the work and the prices charged for it. The defendants had paid during the course of the work 800*l.* on account in regard to each of the contracts to the plaintiffs. The learned counsel said that one of the main questions in dispute was as to extras or additional work, and which, he con-

tended, was not under the arbitration clause referred to the engineer of the defendants. The only matters referred to that gentleman were disputes relating to the quality of the workmanship and materials.

The Master of the Rolls: The point is that he is not appointed arbitrator to decide whether extras were or were not extras?

Mr. Spencer Bower: Yes, that is the whole point. I am most anxious that the case should go before an Official Referee. I not only consent to that course but ask for it.

Mr. Lush submitted that on the proper construction of the contracts the question of extras was referred to the arbitrator, viz., the defendants' engineer.

The Master of the Rolls in giving judgment, said he thought it was clear from the terms of the contracts that the parties intended that all disputes arising under the contracts should be referred to the defendants' engineer, and that the plaintiffs must submit to his jurisdiction.

Lord Justice Matthew concurred, and the appeal was dismissed with costs.

ACTION BY AN ARCHITECT.

AT the Manchester Assizes on the 10th inst. Mr. Justice Bucknill, sitting without a jury, resumed the hearing of an action which was part heard at the Lancaster Assizes. The plaintiff was Mr. Herbert Howarth, an architect, of Morecambe, who sought to recover from Messrs. John Gardner and John Scott, joint proprietors of the Alhambra Palace, Morecambe, the sum of 370*l.* 6*s.* 8*d.* for professional services in connexion with the building of the Alhambra. The total cost of the structure was 25,790*l.*, and the plaintiff's charges amounted to 1,539*l.* 19*s.*, of which a sum of 1,160*l.* 12*s.* 4*d.* had been paid. The action was brought to recover the balance. The defence was that the plaintiff did not render certain services for which he claimed, and that the commission to which he was entitled and which he had been paid was 5 per cent. on 22,581*l.* 10*s.* 6*d.*, and not upon 25,790*l.* Negligence was also alleged, and for this a sum of 230*l.* was counter-claimed.

Mr. Marshall Robinson, architect, of Bolton, called in support of the plaintiff's case, gave it as his opinion that the charges were quite reasonable.

Mr. H. Ross, architect, of Accrington, gave similar evidence. He added that there was not at present an established custom whereby architects were entitled to charge commission in connexion with an electric light installation. Electricity was too recent for the establishment of such a custom but the charge was usual in the case of gas fittings.

Mr. Samuel Wright, building and quantity surveyor, of Morecambe, agreed with the evidence given as to the measurements.

Evidence was then called on behalf of the defendants. Mr. Joseph Parkinson, architect, of Morecambe, stated that, in his opinion, the plaintiff was not justified in charging in respect of the draperies, decorating, or electric lighting. It would have been different if, as architect, he had been asked to get estimates for these things.

Other witnesses were called to prove that the plaintiff should only have charged for those things he actually superintended.

The case was adjourned.

INJUNCTION GRANTED AGAINST A CORPORATION.

THE case of Wilkinson *v.* the Corporation of Newcastle-on-Tyne came before Mr. Justice Joyce in the Chancery Division on the 17th and 18th inst., in which the plaintiffs claimed an injunction to compel the defendants to remove a piece of connecting tram line placed round the corner of the plaintiffs' premises which the plaintiffs alleged was not authorised by their Act and was not shown on their deposited plans. The deposited plans showed a tram line round the corner of Pilgrim-street and Moseley-street, opposite to the plaintiffs' premises, but none round their own corner, and it was the additional line round their own corner to which they objected. The defendants contended that the line in question, although not specifically authorised, was in fact authorised by some general words in Section 7 of the Act.

Mr. Younger, K.C., and Mr. R. J. Parker appeared for the plaintiffs; and Mr. Hughes, K.C., and Mr. T. H. Watson for the Corporation.

It appeared from the opening statement of Mr. Younger that the plaintiffs were a firm of solicitors in Newcastle, and were the owners in fee simple of valuable property situate at the corner of Pilgrim-street and Moseley-street, Newcastle, the site of which they purchased in 1898 for 20,000*l.* On this site the plaintiffs built offices, the ground floor being occupied by the Norwich Union Fire Office, and the rest of the building by other tenants. It was incumbent, said counsel, that express notice should be served on the frontagers in regard to this tramway, which must be not less than 9 ft. 6 in. from the pavement. The defendants denied having contravened the Act and traversed the other allegations in the statement of claim, and said that the construction of the tram lines was completed before the action was commenced. The learned counsel said that if the work of the Corporation was to be justified under Section 7 of the Act, it must be on the ground that it was a junction. He submitted it was not a junction. The word "junction" as used in the Act of Parliament showed that it meant in every case a point of contact between two lines. There was one junction expressly pointed out on the deposited plan, and this was a junction in Pilgrim-street, to the south of the plaintiffs' premises. The court could not construe the words "works or conveniences" in Section 7 of the Act so as to extend to a fresh line of tramway. If these tramways remained opposite to the plaintiffs' premises the free access to them would be practically cut off so far as carriages were concerned. The injury thus caused would be accentuated if the original design of the plaintiffs in regard to their property was carried out, and the premises now occupied by the Norwich Union Fire Office and others were converted into shops. Since the action had been commenced the plaintiffs had been served with another frontagers' notice by the Corporation, who were now promoting a Bill in Parliament to authorise the construction of the tramway they had already made. He asked his Lordship to grant the plaintiffs the relief they sought.

Mr. Hughes, for the defence, submitted that the Corporation, in applying to Parliament, were simply striving to put their rights beyond dispute, and that the works complained of were necessary and proper junctions.

In the result, his Lordship, after hearing evidence, gave judgment, ordering the Corporation to remove so much of the rails as was not shown on the deposited plans; but he suspended the operation of the injunction over August 31, and gave defendants liberty to apply for an extension of the time.

In the meantime, the defendants undertook not to use the piece of the tramway in question.

The defendants were also ordered to pay the costs of the action.

A BUILDING DISPUTE, DALSTON.

REFERRING to the report in our last issue, page 167 *ante*, the building dispute case came on again on Friday last week, the District Surveyor, Mr. Henry Lovegrove (not James, as printed in our last issue) reported that the defendant intended to comply with his certificate, and the work was in progress.

CLAIM BY AN ARCHITECT.

THE case of Battson *v.* Lewis was heard by Mr. Justice Wright in the King's Bench Division last week—an action by the plaintiff, an architect, to recover from the defendant 67*l.* 3*s.* for work done for the defendant in the erection of a house in East-side-lane, Woking.

The plaintiff's case was that in July, 1899, he was employed by the defendant to prepare plans for the house in question. He prepared the necessary plans, which were subsequently altered to the defendant's order. He (plaintiff) superintended the erection of the house, which cost about 2,500*l.* to erect, and gave the necessary directions for certain alterations, such alterations being with the approval, sanction and consent of the defendant. The plaintiff had been paid 60*l.* 10*s.* on account, and now sued for the balance of his fees.

The defence was that the plans were drawn in a negligent manner, causing great expense and damage to the defendant. The defendant counter-claimed against the plaintiff for 116*l.* 4*s.* 1*d.*, the amount he alleged he had to spend in consequence of the plaintiff's plans being defective.

In the result, his Lordship, after hearing evidence, in giving judgment, said it was impossible to get exactly at the rights of the case. The plaintiff had admitted that he had blundered. It was clear to him that the defendant's claim against the plaintiff was well founded to some extent. He did not think that any substantial figure of damage had been made out, but still, when a professional gentleman was paid to do professional work and then it turned out that his plans were imperfect, one did not expect to pay the same fees as if the plans were perfect. His Lordship said he should allow the defendant 30*l.* on his counter-claim, and the result would be that that sum would be reduced from the plaintiff's claim and given to the defendant in settlement of his counter-claim. The plaintiff would have the costs of the claim and the defendant the costs of the counter-claim.

Messrs. Dodd and McCowan appeared as counsel for the plaintiff, and Mr. Montague Lush for the defendant.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

18,457.—A METHOD OF CASTING CEMENT PIPES: *C. J. Kuelberg.*—The inner cylinder of the apparatus is adapted so as to ascend and descend without turning, and whilst the mould is rotated and carries the cement round with it, at the same time raising the cylinder as it presses against helical projections therefrom. The apparatus, which is available for making pipes of cement or similar material, is more fully specified in Nos. 18,353 of 1899, and 9,131 of 1900.

18,459.—IMPROVEMENT OF FIREPLACES: *J. Alves.*—The inventor contrives that some air shall flow through the front and bottom bars to a box of the ashpit, and so into a chamber at the back of the grate and thence through lower and upper rows of holes. Confer also No. 4,910 of 1899.

18,463.—APPLIANCES FOR THE DOORS OF THE CAGES AND WELLS OF LIFTS: *P. D. Root.*—A spring catch that, when pushed outwards, will be disengaged by a bar that projects from the cage, holds the well-door (that runs upon rollers) closed, on the well door are vertical bars that are passed on their outside by vertical bars on the cage-door; thus, as the one door slides to open on its rollers, the other is carried with it. The cage will be locked at a floor by means of projections which prevent a vertical movement of the bars upon the cage door, so that both doors will become shut before the cage is left free to move.

18,467.—A SAFETY APPLIANCE FOR LAMPS: *G. Grimm.*—In order that the lamp may not be tilted or upset, the base of its pedestal or standard is rested upon a sunken or hollowed disc, to which the pedestal is secured between pivoted arms that are detachably fastened with a chain through their loops. For additional security, the disc may be screwed through its centre by a screw to a socket that will fit into a table, shelf, &c. In another form there are radial wires which join a small middle plate to a ring, and the inner ends of the other wires that hold the lamp standard are chained together.

18,486.—MEANS OF HEATING BUILDINGS: *R. Maclaurin and A. J. H. Moffat.*—Radiators utilise hot gases from smokeless fuels and from lamps or gas jets. For a gas or an oil-lamp replace the front plate, made of some good conducting metal, is so sloped as to turn the heat down to the floor, a non-conducting back plate being placed against fire-brick, and the hot gases are directed, with baffler, over the front plate on their way to the chimney. Other modifications are specified for a shell-radiator heated with gas jets, and an apparatus wherein gas jets impinge upon asbestos or fireclay balls, &c., and the hot gases flow into a radiator as described.

18,539.—GRATES AND FIRE-BARS: *C Dicterie.*—For conducting air to the surface of the fire to consume the smoke, double bars steeply inclined are set at the sides of the grate, and projections are fashioned upon the bars, or at their ends only. In another form the grate is fitted with block gratings at each side, which may be extended to beneath the surface of the grate.

18,565. — A HOT AND COLD WATER MIXING VALVE FOR LAVATORY BASINS, BATHS, &C.: *W. Thomson.*—Two separated passages convey the hot water and high-pressure cold water into a mixing-chamber, a screw-down valve closes the outlet, and has a conical, or a hollow perforated, plug upon its underside, a lift-valve is attached to the top of the hot-water pipe, and when closed is forced upon its seating by pressure of the cold water; as the screw-down valve is opened the cold water only will flow until its pressure is reduced to allow the valve to rise, and then both cold and hot water will flow, as the valve is farther opened the conical plug shuts off the cold supply, and hot water alone will flow.

18,579.—IMPROVEMENTS OF FILES: *L. M. Stewart.*—Slotted plates which are bevelled on their edges to constitute cutting-edges with their faces ground are clamped upon a core between a sliding piece and a removable head, and inclined cross-cuts are milled in the cutting-edges.

18,583.—AN APPLIANCE FOR SPREADING SEWAGE OVER FILTER-BEDS: *G. E. Ridgway.*—A cover or plate, having curved tangential channels beneath it, is mounted upon the upper end of the supply pipe, the channels are connected to others underneath a rotating stand fitted with projections, in the form of troughs, to which are also attached perforated troughs having discharge areas that can be regulated at will, and which are held up with rods from a cap which rotates upon a stationary pillar.

18,615.—A COMBINED ELECTRICAL CUT-OUT AND ELECTRO-MAGNETICAL CUT-OUT: *E. M. Hewlett.*—Suitable openings take the fuse which is connected to the terminals that are protected with arcing tips connected to them, the electro-magnet has flat extended pole-plates lined with refractory plates, and an open-mouthed box is formed of side pieces. In a variant shape a removable block carries the fuse, and spring contacts which help to keep the box in its position effect connexion with the fixed terminals.

18,625.—A VICE: *J. Long.*—A horizontal opening of the base of the fixed jaw takes a pivot pin secured to the bench, and there is a vertical opening in the base of the fixed jaw, whereby the jaws can be set either vertically or horizontally when the pin is inserted into either the one or the other hole. In the slide of the movable jaw is an adjustment screw to be turned into engagement with a nut in a block that is pivoted on to the fixed jaw and is curved so as to engage with the pivot-pin, which will be gripped to keep all the parts rigid, as the block rocks a little upon its pivot when the vice has gripped the work; otherwise, the block is extended in a forward direction and is fitted with rollers that press upwards against the slide.

18,653.—A WINDOW-SASH FASTENER: *A. Stevens.*—A bolt, having a bevelled nose, and to be shot with a spring and withdrawn with a knob, is mounted in the meeting-rail of the lower sash, that it may engage with a slot cut in the corresponding rail of the upper sash.

18,666.—A CLAMP OR COUPLING FOR DRAIN-PIPES AND ELECTRICAL WIRE PIPES AND CONDUITS: *W. Bayliff and T. D. Bayliff.*—The clamp consists of two or more parts, each of which is fashioned with a half-rounded rim or ledge about its centre upon which the pipe-ends will rest. A coupling is made with a socket that has mouths, internally threaded and conical, for taking the filling, and has projections that will serve for its unscrewing when the joint is to be broken. For stopping or strengthening a tube or pipe, or for coupling purposes, the flanges of the clamp are adapted to interlock and to allow movement only lengthwise. Other modifications are specified of the contrivance, which is generally available for covering or closing defects, apertures, and so on, and for strengthening or other uses.

18,681.—A FIRE ALARM: *H. Simpson and R. Thomlinson.*—An apparatus for ringing either of two electrical bells has a U-shaped tube, which is joined to a frame, of which the knife-edges are carried by a fixed support. So long as the temperature remains normal a sliding-weight will balance the tube upon the edges in a horizontal position, but with an access of temperature the expansion of some liquid—such as a spirit or light oil—within one limb of the tube will displace the mercury which is contained in the lower limb of the tube, and cause it to flow into an empty space at the end of the limb. As the position of the centre of gravity becomes thereby changed a pointer upon the frame sets up contact with an insulated stopping-piece and rings one bell. Another bell will be similarly rung through a contact with another stop-piece when the temperature has become less than normal. The expanding liquid may be filled into a fixed reservoir in some instances.

18,736.—A CRAMP FOR MITERING: *J. Griffin.*—A jaw, and two bifurcated jaws upon the ends of curved bars that are pivoted together, serve for gripping the work; a screw operates the first-named jaw, being inserted through a boss at the pivot-point of the forked jaws, and the flanges of that jaw are pressed against flanges upon its arms, which draw the two forked jaws together when the other jaw is forced towards them.

18,759.—A VENTILATING CONTRIVANCE: *B. Schroer.*—A cap is fitted on to the top of the chimney or shaft, and consists of a cover which is stepped so as to become wider upwards, and has air-inlets set obliquely in its sides.

18,789.—AN ELECTRICAL ENERGY METER: *F. L. Catenhusen.*—The conductive disc of an induction motor meter for a single alternating current moves through the air gap of an electro-magnet, also between a stationary armature and a horseshoe electro-magnet, which carries highly inductive coils that are connected between the mains. On the first-named magnet are a main current coil and a co operating coil, the latter being connected in series with a high non-inductive resistance between the mains. The disc will be driven by the independent magnetical fields produced by the arrangement. Under No. 18,790 the same inventor devises a regulator for use with electricity, water, gas, and similar meters, comprising a helix which will rotate inside a cylinder containing liquid, and has a spindle that is driven by the meter.

18,794.—AN ELECTRICAL INSULATOR: *W. Chapman.*—The insulator, which is fashioned with a middle opening which can be carried by a ring, or upon a shelf, has an upper projecting shed, to be turned over either outwards or inwards, and a lower shed. Insulating material may be filled in the cavity so as to cover the head of a bolt.

18,801.—APPARATUS FOR USE WITH SAFETY LAMPS: *C. Darrah and J. G. Patterson.*—The inventors devise a portable apparatus for igniting certain safety-lamps after the kind specified in No. 9,462 of 1899, and for obviating any risk of explosion. An air-tight and gas-tight box contains the dynamo, which is turned with a handle and gearing, whilst its rotation in the wrong direction is prevented by the engagement of a pawl with one of the wheels. Pipes from an oil vessel supply a lubricant to the gearing. A plug attached to the lamp is either placed above the lid or connected to the conductors. When the lamp has been screwed on to the plug, it is hung upon a hook projecting from a standard secured to the lid of the box whilst the handle is being turned. Any unauthorised use of the apparatus is prevented by the locking of the handle to the side of the box with a screw for which a detachable key is supplied.

18,808.—A VENTILATOR FOR THE ROOF OF A BUILDING: *F. McRae.*—The portions of the ventilator that are in contact with the roof are made in the shape of a rectangular box, and have their lower and upper ends opened, the lower sides being flared or suitably formed otherwise as the roof may require. A rain-shed, with a triangular or semi-circular cross-section, is fitted above the upper and open side, and the end supports have apertures.

18,810.—MEANS OF SCREWING TUBE BENDS AND SIMILAR FITTINGS: *F. J. T. Haskew.*—For screwing bends, &c., at the tube-ends at one time together, are furnished two running head-stocks set at the angle required upon beds which carry the bend or other work upon a holder which holds the work in its grips. The grips are disposed upon a carrier in the form of a capstan, that can be rotated, and an ordinary expanding screwing-die is mounted upon each of the two head-stocks.

MEETINGS.

FRIDAY, FEBRUARY 21.

Architectural Association Discussion Section.—Mr. F. C. Eden on "The Organ: Its Proper Position and Architectural Treatment." 7.30 p.m.

Royal Institution.—Mr. W. Duddell on "Musical and Talking Electric Arcs." 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. Priestley, B.A., on "Duties of Sanitary Inspectors: II.: Indoor." 8 p.m.

Institution of Mechanical Engineers.—Fifty-fifth Annual General Meeting, when the annual report of the Council will be presented to the meeting, and the results of the ballot for the annual election of the President, Vice-Presidents, and Members of Council will be announced. Subsequently, the meeting will be made "Special," for the consideration of a preposal to increase the number of ordinary Members of Council from fifteen to twenty-one, and to provide that seven instead of five Members of Council shall retire annually. The discussion on "Modern Machine Methods" will be concluded, and the author, Mr. H. F. L. Orcutt, will reply. If time permit, the following short papers on the "Fencing of Different Kinds of Machinery" will be presented, with a view to their being collectively discussed on Friday, March 21:—"Fencing of Steam and Gas Engines," by Mr. Henry D. Marshall; "Fencing or Guarding Machinery Used in Textile Factories," by Mr. Samuel R. Platt; "Protection of Lift-Shafts, and Safety Devices in Connexion with Lift-Doors and Controlling Gear," by Mr. Henry C. Walker; "Guarding Machine Tools," by Mr. W. H. Johnson.

Birmingham Architectural Association.—Paper by Mr. E. Wood.

Glasgow Architectural Craftsmen's Society.—Mr. T. S. Fraser on "The Renaissance of Scotland." 8 p.m.

SATURDAY, FEBRUARY 22.

Builders' Foremen and Clerks of Works' Institution.—Annual dinner, King's Hall, Holborn Restaurant. 6 p.m.

Royal Institution.—Rt. Hon. Lord Rayleigh on "Some Electrical Developments" (II.). 3 p.m.

Builders' Foremen's Association.—Paper by Mr. A. S. E. Ackermann, M.Inst.C.E., entitled: "Some Engineering and other Observations in 1901, during a 5,000 miles Tour in the United States." 8.15 p.m.

Institution of Junior Engineers.—Visit to the New Baths and Washhouses of the Borough of Fulham, Melmoth-place. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Lambeth Disinfecting Station, Wanless-road, Loughborough Junction. 3 p.m.

Edinburgh Architectural Association.—Visit to the North British Railway Co.'s Hotel at Waverley.

Dundee Institute of Architecture.—Visit to Dunfermline.

MONDAY, FEBRUARY 24.

Surveyors' Institution.—Mr. Rowland Berkeley on "Electric Railways and Street Compensations." 8 p.m.

London Master Builders' Association.—Dinner at the Empire Hall, Trocadero Restaurant, Piccadilly-circus, W. 6.30 p.m.

Society of Arts (Cantor Lectures).—Mr. Cyril Davenport, F.S.A., on "Personal Jewellery from Prehistoric Times"—III. 8 p.m.

TUESDAY, FEBRUARY 25.

Institution of Civil Engineers.—Further discussion on Messrs. W. M. Mordey and Bernard M. Jenkin's paper on "Electrical Traction on Railways." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, B.A., on "Duties of a Sanitary Inspector"—III. Offensive Trades and Trade Nuisances, &c." 7 p.m.

Royal Victoria Hall (Waterloo-road, S.E.).—Mr. Barry Parker on "Beauty in Buildings and Some Things which Lead to it." 8.30 p.m.

WEDNESDAY, FEBRUARY 26.

Society of Arts—Professor Roberts Beaumont, M.I. Mech.E., on "Recent Inventions in Weaving Machinery. 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Soapworks.

City of London College Science Society.—Mr. E. A. Robins on "The Theory and Practice of Photographic Manufactures."

Devon and Exeter Architectural Society (Plymouth, Devonport, and Stonehouse Branch).—Address by Mr. Silvanus Trevail, F.R.I.B.A.

Northern Architectural Association.—Mr. Algernon P. B. Barker, B.A., on "Duties of Building Owners as to Sewers." 7.30 p.m.

Edinburgh Architectural Association.—Mr. W. G. Burn-Murdoch on "Historical Design proposed for the New Municipal Buildings," with limelight views. 8 p.m.

THURSDAY, FEBRUARY 27.

Carpenters' Hall, London Wall (Free Lectures on Matters connected with Building).—Mr. H. H. Statham on "The Architectural Treatment of Bridges." Mr. Aston Webb, A.R.A., will preside. 8 p.m.

Society of Arts (Indian Section).—Mr. Nilkanth B. Wagle, B.A., on "The Industrial Development of India." 4.30 p.m.

Leeds and Yorkshire Architectural Society.—Paper by Mr. W. Burton, F.C.S. 6.30 p.m.

Society for the Encouragement of the Fine Arts.—Conversazione at the Galleries of the Royal Institute of Painters, Piccadilly.

Institution of Electrical Engineers.—(1) Major-General C. E. Webber, C.B., R.E., Past President, on "Electric Shock and Legislation thereon." (2) Mr. F. B. Aspinall on "Electric Shocks." (3) Mr. A. P. Trotter on "Electric Shocks at 500 volts" (illustrated by a demonstration at 500 volts). 8 p.m.

FRIDAY, FEBRUARY 28.

Architectural Association Discussion Section.—Mr. T. H. Russell, M.A., on "Dartmoor Granite." 7.30 p.m.

Institution of Civil Engineers.—(Students' meeting).—Mr. A. M. Arter on "Indicating High-speed Steam-engines." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. A. Wellesley Harris on "Methods of Disinfection." 7 p.m.

Devon and Exeter Architectural Society.—Meeting at Exeter. Mr. A. S. Parker on "Building By-laws."

SATURDAY, MARCH 1.

Royal Institution.—Rt. Hon. Lord Rayleigh on "Some Electrical Developments"—III. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Marylebone Stoneyard, Richmond-street, Edgware-road, W. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 4.—By RENDELL & SYMONS (at Totnes).

Blacktawton, Devon.—Grimpstone Farm, 168 a. 1 r. 14 p., f.	£3,100

February 6.—By H. FURZE & Co. (at Croydon).

Wallington.—1 and 2, Cranley-gardens, u.t. 95½ yrs., g.r. 10*l.* 10*s.*, e.r. 74*l.*	695
Onslow-gardens, a freehold building site	125
Stanley-rd., four freehold building plots	100

By WM. HOUGHTON.

Walthamstow.—Hale End-rd., The Royal Oak, b.-h., with goodwill; also a cottage adjoining, f., p.	8,070

February 11.—By HUNTER & HUNTER.

Chelsea.—107, King's-rd., with wheelwright's premises, yard, &c., in rear, u.t. 39½ yrs., g.r. 25*l.*, y.r. 90*l.*	1,020
South Kensington.—13, Ovington-gardens, u.t. 22½ yrs., g.r. 9*l.*, p.	950

By LEWIS ABRAHAMS (at Masons' Hall Tavern).

Haymarket.—Nos. 51 and 52, Kirk's Restaurant, u.t. 14 yrs., r. 325*l.*, with goodwill	1,575

February 12.—By H. DONALDSON & SON.

Dalston.—29, Colveston-cres., u.t. 54 yrs., g.r. 7*l.* 10*s.*, y.r. 48*l.*	510
Stoke Newington.—14 and 16, Mildmay-rd., f., y.r. 70*l.*	1,145
Homerton.—5, 7, 9, 46, 48, and 50, Holmbrook-st., u.t. 20½ and 22 yrs., g.r. 13*l.* 10*s.*, w.r. 120*l.* 18*s.*	520
Upper Holloway.—22, Chester-rd., u.t. 78 yrs., g.r. 6*l.*, e.r. 42*l.*	380

By THURGOOD & MARTIN.

Cranbrook, Kent.—High-st., four freehold cottages, w.r. 35*l.* 2*s.*	480

February 13.—By H. J. BLISS & SONS.

Hackney.—30, Downs Park-rd., u.t. 50 yrs., g.r. 6*l.*, e.r. 40*l.*	465
Bethnal Green.—128, Vallance-rd., u.t. 17 yrs., g.r. 5*l.*, w.r. 33*l.* 16*s.*	100
4 and 7, Minto-pl., w.r. 62*l.* 8*s.*, also l.g.r. 8*l.*, u.t. 17 yrs., g.r. 16*l.*	165

By ROGERS BROS.

Peckham.—62, Meeting House-lane (S), u.t. 80 yrs., g.r. 6*l.*, y.r. 32*l.*	250

By WESTON & SONS.

Forest Hill.—6, Derby-villas, u.t. 55 yrs., g.r. 5*l.* 15*s.*, y.r. 30*l.*	270
Clapham.—26, 28, and 30, Larkhall-rise, f., w.r. 98*l.* 16*s.*	1,190
Wimbledon.—Dundonald-rd., f.g.r. 18*l.*, reversion in 86 yrs.	460
Dundonald-rd., l.g.r. 10*l.*, reversion in 80 yrs.	235
Newton-rd., f.g.r. 16*l.*, reversion in 75½ yrs.	495
Benefit of a profit agreement entitling to moiety of net profits to arise from the Croham Hurst Building Estate, South Croydon, area 16 a., u.t. 99 yrs., g.r. 20*l.* per acre	1,300

By C. C. & T. MOORE.

Commercial-road East.—Nos. 436 and 438 (S), area 2,440 ft., f., y.r. 130*l.*	2,800
No. 655 (S), f., y.r. 30*l.*	1,010
No. 657 (S), with off-licence, f., y.r. 55*l.*	1,400
No. 659, 661, 663, and 665 (S), y.r. 235*l.*	3,850
St. George's East.—Christian-st., four railway arches (Nos. 93 to 96), u.t. 939 yrs., g.r. nil, e.r. 125*l.*	1,560
Spitalfields.—7 and 9, Fournier-st. (S), f., y.r. 135*l.*	2,940
Aldgate.—41, Middlesex-st. (S), f., y.r. 80*l.*	2,000
67, Middlesex-st. (S), f., y.r. 90*l.*	2,000
Mile End.—84 to 94 (even), Rutland-st., u.t. 33 yrs., g.r. 33*l.*, w.r. 390*l.* 16*s.*	2,330
3, Clark-st., u.t. 33 yrs., g.r. 6*l.*, w.r. 85*l.* 16*s.*	530
Limehouse.—22 to 30 (even), Grenade-st., building site, area 2,420 ft., f.	570
St. George's East.—134 and 135, St. George-st., and 38, Denmark-st., f., y.r. 197*l.* 12*s.*	1,810
Bow.—13, St. Stephen's-rd., u.t. 52 yrs., g.r. 4*l.*, y.r. 40*l.*	570
61 and 63, Lyal-rd., u.t. 47½ yrs., g.r. 8*l.*, w.r. 72*l.* 16*s.*	680
84 and 85, Lyal-rd., u.t. 47½ yrs., g.r. 8*l.*, w.r. 72*l.* 16*s.*	700

By STIMSON & SONS.

Pimlico.—312, Vauxhall Bridge-rd. (S.), f., e.r. 70*l.*	1,000
Walworth.—58, 60, 62 and 64, Barlow-st., u.t. 31 yrs., g.r. 23*l.*, w.r. 145*l.* 12*s.*	630
1, 3, 5 and 7, Tatum-st., u.t. 31 yrs., g.r. 29*l.*, w.r. 187*l.* 4*s.*	830
Harringay.—Umfreville-rd., f.g.r.'s. 26*l.*, reversion in 86 yrs.	680
Umfreville-rd., f.g.r.'s. 40*l.*, reversion in 87 yrs.	1,080
Tooting.—Devonshire-rd., a plot of building land, f.	225
Soho.—133, Wardour-st. (S), with workshop and stabling in rear, u.t. 8½ yrs., g.r. 90*l.*, y.r. 161*l.* 2*s.*	115
Battersea.—138 to 170 (even), New-rd. (S), u.t. 26½ yrs., g.r. 28*l.*, w.r. 200*l.* 4*s.*	750
Peckham.—Marmont-st., f.g.r.'s. 30*l.*, reversion in 50½ yrs.	815

Sydenham.—Hillmore-grove, f.g.r. 27*l.* 10*s.*, reversion in 89 yrs. £700
Forest Gate.—Pevensey-rd., f.g.r. 25*l.*, reversion in 98 yrs. 625
Finsbury Park.—106, Blackstock-rd. (S), u.t. 35 yrs., g.r. 6*l.*, y.r. 32*l.* 240
Stepney.—1 to 11, Black Bull-court, part f. and part u.t. 83 yrs., g.r. 22*l.*, w.r. 187*l.* 4*s.* 622
Hackney.—85, Morning-lane, u.t. 71½ yrs., g.r. 5*l.*, w.r. 44*l.* 4*s.* 215
112, Chalgrove-rd., u.t. 71½ yrs., g.r. 3*l.* 10*s.*, w.r. 34*l.* 4*s.* 185

February 14.—By A. MARTIN NEWCOMBE.

Beckenham.—Mackenzie-rd., Lansdown Villa, f., e.r. 40*l.* 650
Penge.—41, Tennyson-rd., u.t. 73½ yrs., g.r. 4*l.*, w.r. 26*l.* 170

By PEACEY & FULLER.

Bayswater.—63, Artesian-rd., u.t. 44 yrs., g.r. 7*l.*, y.r. 40*l.* 370
32, Courtnell-st., u.t. 44 yrs., g.r. 6*l.* 6*s.*, r. 40*l.*... 370

By TRIST & Co.

Clapham Common.—Balham Hill, Tregothnan, u.t. 65 yrs. g.r. 24*l.* 12*s.* 6*d.*, y.r. 85*l.* 950

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.		
Hard Stocks	1	11	6	per 1,000 alongside, in river.	
Rough Stocks and Grizzles	1	9	6	,,	,, ,,
Facing Stocks	2	12	0	,,	,, ,,
Shippers	2	5	0	,,	,, ,,
Flettons	1	8	0	,,	at railway depôt.
Red Wire Cuts ..	1	12	0	,,	,, ,,
Best Fareham Red	3	12	0	,,	,, ,,
Best Red Pressed Ruabon Facing.	3	5	0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4	6	6	,,	,,
Do., Bullnose	4	10	0	,,	,, ,,
Best Stourbridge Fire Bricks	4	5	6	,,	,, ,,
GLAZED BRICKS					
Best White and Ivory Glazed Stretchers.....	13	0	0	,,	,, ,,
Headers	12	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	17	0	0	,,	,, ,,
Double Stretchers	19	0	0	,,	,, ,,
Double Headers	16	0	0	,,	,, ,,
One Side and two Ends	19	0	0	,,	,, ,,
Two Sides and one End	20	0	0	,,	,, ,,
Splays, Chamfered, Squints.....	20	0	0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	14	0	0	,,	,, ,,
Double Stretchers	15	0	0	,,	,, ,,
Double Headers..	14	0	0	,,	,, ,,
One Side and two Ends	15	0	0	,,	,, ,,
Two Sides and one End	15	0	0	,,	,, ,,
Splays, Chamfered, Squints.....	14	0	0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.

	s.	d.	
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	,, ,,
Best Portland Cement	32	0	per ton, delivered.
Best Ground Blue Lias Lime..	25	0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11*s.* 0*d.* per yard, delivered.
Stourbridge Fire-clay in sacks, 16*s.* 6*d.* per ton at rly. dpt.

STONE.

	s.	d.	
Ancaster in blocks	1	11	per ft. cube, deld. rly. depôt.
Bath ,, ...	1	7	,, ,,
Farleigh Down Bath ..	1	8	,, ,,
Beer in blocks	1	6	,, ,,
Grinshill ,, ...	1	10	,, ,,
Brown Portland in blocks	2	2	,, ,,
Darley Dale in blocks..	2	4	,, ,,
Red Corsehill ,,	2	5	,, ,,
Closeburn Red Freestone	2	3	,, ,,
Red Mansfield ,,	2	4	,, ,,
Hard York in blocks ..	2	10	,, ,,
Hard York 6 in. sawn both sides landings, 10 sizes (under 40 ft. sup)	2	8	per ft. superf. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3	0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1	3	,, ,,
,, ,, 2 in. self-faced Ditto	0	9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2		3 per ft. cube. deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2		7 per ft. super. deld rly. depôt.
,, ,, ,, 3 in. do.	1		2½ ,, ,,

PRICES CURRENT (*Continued*).

SLATES.

in.	in.	£	s.	d.	
20×10 best blue Bangor		12	0	0	per 1000 of 1200 at rly. dep.
,, best seconds	,,	11	10	0	,, ,,
16×8 best	,,	6	15	0	,, ,,
20×10 best blue Portmadoc	.. ..	11	5	0	,, ,,
16×8 best blue Portmadoc		6	0	0	,, ,,
20×10 best Eureka unfading green		12	2	6	,, ,,
16×8	,, ,,	7	5	0	,, ,,
20×10 permanent green		10	5	0	,, ,,
16×8	,, ,,	5	17	6	,, ,,

TILES.

	s.	d.	
Best plain red roofing tiles..	42	6	per 1,000, at rly. depôt
Hip and valley tiles....	3	7	per doz. ,, ,,
Best Broseley tiles	48	6	per 1,000 ,, ,,
Hip and valley tiles....	4	0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000 ,, ,,
Do. ornamental Do.	60	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50	9	per 1,000 ,, ,,
Hip tiles	4	1	per doz. ,, ,,
Valley tiles.....	3	8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14	10	0	16	0	0
Deals: best 3 by 9.....	13	10	0	15	0	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in	10	10	0	11	10	0
Battens: best 2½ by 6 and 3 by 6 .	9	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	9	10	0	,, ,,	,,	
2 in. by 4 in. and 2 in. by 6 in. .	8	10	0	9	10	0
2 in. by 4½ in. and 2 in by 5 in. ..	8	0	0	9	0	0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0	10	0	more than battens.		
¾ in.	1	0	0	,,		
Fir timber: Best middling Dantzig or Memel (average specification)	At per load of 50 ft. 4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Swedish balks.....	2	15	0	3	0	0
Pitch-pine timber (30 ft.).....	3	0	0	3	10	0

JOINERS' WOOD.

	At per standard.					
White Sea: First yellow deals, 3 in. by 11 in.	22	0	0	23	0	0
3 in. by 9 in.	20	0	0	21	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	18	0	0
Second yellow deals, 3 in. by 11 in.	18	0	0	20	0	0
,, ,, 3 in. by 9 in.	16	10	0	18	10	0
Battens, 2½ in. and 3 in. by 7 in.	13	0	0	14	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	14	0	0	15	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	20	0	0	21	0	0
Do. 3 in. by 9 in.	17	0	0	18	0	0
Battens.....	13	0	0	14	0	0
Second yellow deals, 3 in. by 11 in.....	15	0	0	16	10	0
Do. 3 in. by 9 in.	13	10	0	14	10	0
Battens.....	11	0	0	12	0	0
Third yellow deals, 3 in. by 11 in.....	12	10	0	13	10	0
Do. 3 in. by 9 in.	12	0	0	13	0	0
Battens.....	10	0	0	11	0	0
White Sea and Petersburg:—						
First white deals, 3 in. by 11 in.	14	0	0	15	0	0
,, ,, ,, 3 in. by 9 in.	13	0	0	14	0	0
Battens.....	11	0	0	12	0	0
Second white deals 3 in. by 11 in.	13	0	0	14	0	0
,, ,, ,, 3 in. by 9 in.	12	0	0	13	0	0
,, ,, ,, battens.....	9	10	0	10	10	0
Pitch-pine: deals	16	0	0	18	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes..	32	0	0	33	10	0
Broads (12 in. and up).....	2	0	0	more.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine Oddments	20	0	0	22	0	0
Kauri Pine—Planks, per ft. cube .	0	3	6	0	4	6
Dantzig and Stettin Oak Logs— Large, per ft. cube	0	2	6	0	3	0
Small ,, ,, ...	0	2	1	0	2	6
Wainscot Oak Logs, per ft. cube ..	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	7½	0	0	8
¾ in. do. do.	0	0	7	-	-	-
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	16	0	0	20	0	0
American Whitewood Planks— Per ft. cube.....	0	3	0	0	3	6
Prepared Flooring—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	0	0	16	6
1 in. by 7 in. yellow, planed and matched	0	13	6	0	17	6
1¼ in. by 7 in. yellow, planed and matched	0	15	0	1	0	0
6 in. at 6d. per square less than 7 in.						
1 in. by 7 in. white, planed and shot	0	11	0	0	12	6
1 in. by 7 in. white, planed and matched	0	11	6	0	13	6
1¼ in. by 7 in. white, planed and matched	0	13	6	0	15	6
6 in. at 6d. per square less than 7 in.						

PRICES CURRENT (*Continued*).

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	6	2	6	7	2	6
Compound Girders ,, ,,	7	17	6	8	17	6
Angles, Tees and Channels, ordinary sections	7	17	6	8	17	6
Flitch Plates	6	5	0	8	15	0
Cast Iron Columns and Stanchions, including ordinary patterns	7	0	0	8	0	0

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON—						
Common Bars.....	8	0	0	8	10	0
Staffordshire Crown Bars, good merchant quality	8	10	0	9	0	0
Staffordshire "Marked Bars" ..	10	10	0	-	-	-
Mild Steel Bars.....	9	0	0	9	1	0
Hoop Iron, basis price.....	9	5	0	9	15	0
,, ,, galvanised.....	16	0	0	-	-	-
(* And upwards, according to size and gauge.)						
Sheet Iron, Black.— Ordinary sizes to 20 g.....	10	0	0	-	-	-
,, ,, to 24 g.....	11	0	0	-	-	-
,, ,, to 26 g.....	12	10	0	-	-	-
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12	10	0	-	-	-
,, ,, 22 g. and 24 g.	13	0	0	-	-	-
,, ,, 26 g.....	14	0	0	-	-	-
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.....	16	10	0	-	-	-
,, ,, 22 g. and 24 g.	17	0	0	-	-	-
,, ,, 26 g.....	18	10	0	-	-	-
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12	10	0	-	-	-
,, ,, 22 g. and 24 g.	13	0	0	-	-	-
,, ,, 26 g.	14	0	0	-	-	-
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12	5	0	-	-	-
,, ,, 22 g. and 24 g.	13	5	0	-	-	-
,, ,, 26 g.	14	5	0	-	-	-
Cut nails, 3 in. to 6 in.	9	10	0	10	0	0
(Under 3 in. usual trade extras.)						

LEAD, &c.

	Per ton, in London £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3 lbs. & up.	14	5	0	-	-	-
Pipe in coils	14	15	0	-	-	-
Soil Pipe.....	17	5	0	-	-	-
ZINC—Sheet—						
Vieille Montagne..... ton	24	10	0	-	-	-
Silesian	24	0	0	-	-	-
COPPER—						
Strong Sheet..... per lb.	0	1	0	-	-	-
Thin ..... ,,	0	1	1½	-	-	-
Copper nails..... ,,	0	1	1½	-	-	-
BRASS—						
Strong Sheet .. .. ,,	0	0	11	-	-	-
Thin ,, ,,	0	1	1	-	-	-
TIN—English Ingots ..... ,,	0	1	3	-	-	-
SOLDER—Plumbers' ... .. ,,	0	0	6½	-	-	-
Tinmen's .... ,,	0	0	8	-	-	-
Blowpipe ..... ,,	0	0	9	-	-	-

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d.	per ft. delivered.
,, fourths	2¾d.	,, ,,
21 oz. thirds	3½d.	,, ,,
,, fourths.....	3d.	,, ,,
26 oz. thirds	4½d.	,, ,,
,, fourths	4d.	,, ,,
32 oz. thirds	5½d.	,, ,,
,, fourths	5d.	,, ,,
Fluted sheet, 15 oz.....	3d.	,, ,,
,, 21 ,, ...	4d.	,, ,,
½ Hartley's Rolled Plate	2d.	,, ,,
⅓ ,, ,, ,, ...	2½d.	,, ,,
¼ ,, ,, ,, ...	2¾d.	,, ,,

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes.....	per gallon	0	2	-
,, ,, ,, in barrels	,,	0	2	10
,, ,, ,, in drums	,,	0	3	0
Boiled ,, ,, in pipes	,,	0	2	11
,, ,, ,, in barrels	,,	0	3	0
,, ,, ,, in drums	,,	0	3	2
Turpentine, in barrels	,,	0	2	6
,, in drums	,,	0	2	8
Genuine Ground English White Lead	per ton	21	0	0
Red Lead, Dry	,,	20	10	0
Best Linseed Oil Putty	per cwt	0	1	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon £	s.	d.
Fine Elastic Copal Varnish for outside work ..	0	16	6
Best Elastic Copal Varnish for outside work ..	1	0	0
Best Elastic Carriage Varnish for outside work	0	14	0
Best Hard Oak Varnish for inside work.....	0	10	6
Best Extra Hard Church Oak Varnish for inside work	0	10	6
Fine Hard Copal Varnish for inside work.....	0	16	0
Best Hard Copal Varnish for inside work	1	0	0
Best Hard Carriage Varnish for inside work ...	0	16	0
Extra Pale Paper Varnish	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
Best French and Brush Polish	0	10	0

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Laying-out Pleasure Ground	Aldershot U.D.C.	20*l.*, 10*l.* and 5*l.*	Mar. 1
*Proposed Public Offices	do.	100*l.*, 75*l.* and 50*l.*	Mar. 29
*New Market Hall	Market & Baths Com. Oldham Cpn	50*l.*, 30*l.*, and 20*l.*	April 8

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Broken Granite	Diss (Norfolk) U.D.C.	A. Cooper, Surveyor, The Retreat, Diss	Feb. 25
Granite Road Metal, &c.	Dover Town Council	W. Knocker, Town Hall, Dover	do.
Gritstone Setts (4,000 tons)	Droylsden (Lancs) U.D.C.	C. Hall, Engineer, Council Offices, Droylsden	do.
Three Cottages, Jury-street	Derby Corporation	W. Ward, Civil Engineer, Babington-lane, Derby	do.
Workmen's Dwellings, Ordnance-street	Devonport Town Council	Borough Surveyor, 20, Ker-street, Devonport	do.
Office, Shankill-road, Belfast	Directors of the Ulster Bank, Ltd.	W. H. Stephens & Son, Architects, Donegall-sq., North Belfast	do.
Car Shed, &c., Laird-street	Birkenhead Corporation	C. Brownridge, Civil Engineer, Town Hall, Birkenhead	do.
Sewerage Works, Minworth	Castle Bromwich R.D.C.	Willcox & Raikes, Engineers, 63, Temple-row, Birmingham	do.
Flints, &c. (700 tons)	Southampton Corporation	R. R. Linthorne, Municipal Offices, Southampton	do.
Street Works, Albert-street and others	Stanley (Durham) U.D.C.	J. Routledge, Surveyor, Council Offices, Stanley	do.
Church, St. George-on-the-Lea, Darwen		B. V. Johnson, Architect, 20, Victoria-street, S.W.	do.
House, York-road, Killarney	Nottingham City Council	T. T. O'Connor, 60, High-street, Killarney	do.
Refuse Destructor and Power Station, Eastcroft	Watford Union	A. Brown, Civil Engineer, Guildhall, Nottingham	do.
Home for Nurses		C. P. Ayres, Architect, Burvale, Watford	do.
Offices, &c., Bank Foundry, Towerby Bridge, Yorks.	Mr. W. Cooper	W. C. Williams, Architect, 29, Southgate, Halifax	Feb. 26
Shop and House, High Spen, Durham	Manchester Corporation	G. T. Wilson, Architect, 121, Durham-road, Blackhill	do.
Three Bridges over Rochdale Canal		City Surveyor, Town Hall, Manchester	do.
Road Works, Erdington, near Birmingham	Andenshaw (Lancs) U.D.C.	H. H. Humphries, Engr., Public Hall, Erdington, nr. Birmingh'm	do.
Sewerage Works, Corporation-road	Messrs. Phillips & Sons	J. P. Wilkinson, Civil Engineer, 147, Arcade-chmbrs., Manchester	do.
Large Stables, Newport, Mon.	Litherland (Lancs) U.D.C.	Habershon & Co., Architects, 41, High-street, Newport	do.
Kerbing, &c., Linacre-road	Leek (Staffs) U.D.C.	A. H. Carter, Surveyor, Sefton-road, Litherland	do.
Poultry Market	North Dublin R.D.C.	Town Surveyor, Council Offices, Leek	do.
Boundary Wall, Gate, &c.	Belper R.D.C.	J. O'Neill, Council Offices, North Brunswick-street, Dublin	do.
Engine House, &c.	Branksome (Dorset) U.D.C.	J. Frith, Engineer, Baslow, Belper	do.
Hospital, &c.	Barnet U.D.C.	S. J. Newman, Architect, Branksome, Parkstone	do.
*Road Making and Paving Works	Hackney Borough Council	Council's Surveyor, 40, High-street, Barnet	do.
*Annual Contracts	Canterbury Corporation	Council's Engineer, Town Hall, Hackney, N.E.	Feb. 27
Underground Convenience	Hastings Corporation	A. C. Turley, City Surveyor, Town Hall, Canterbury	do.
Boundary Walls, Drainage, &c., at Borough Cemetery	Oldbury U.D.C.	P. H. Palmer, Civil Engineer, Town Hall, Hastings	do.
Sewerage Works		J. T. Eayrs, Civil Engineer, 39, Corporation-street, Birmingh'm	do.
Two Blocks of Houses, Northowram	Maesteg School Board	Walsh & Nicholas, Architects, Museum Chambers, Halifax	do.
School Buildings, Blaenllynvi, Glam.	Hornsea U.D.C.	E. W. Burnett & Son, Architects, Tondu, near Bridgend	do.
Shed and Stores	Ugborough (Devon) School Board	W. E. Warburton, Surveyor, Public Rooms, Hornsea, near Hull	do.
Drainage Works at Schools	Hackney Borough Council	A. Warren, Architect, Buckfastleigh	do.
*Cart Shed, Office and Mess Room, Clifden-road		Council's Engineer, Town Hall, Hackney	do.
Bungalow, Rose Avenue, Elgin, N.B.		C. C. Doig, Architect, Elgin	Feb. 28
Bridge Works, Lochwinnoch, N.B.		P. D. Alexander, Civil Engineer, Dunmyat, Bridge of Weir	do.
Chapel and School, Sandbach Heath		A. Price, Architect, Sandbach	do.
Magazine, Annitaford, Northampton		L. H. Armour, 16, West-street, Gateshead	do.
Renovating Church, Ballaghamcehan, Ireland		Rev. P. Brady, Rossinver, near Manorhamilton	do.
Additions, &c, Police Station, Mountain Ash, Glam	Standing Joint Committee	T. M. Franklen, County Offices, Cardiff	do.
Surveyor's Materials	Tadcaster R.D.C.	T. Scott, Surveyor, Aberford, near Leeds	do.
Cottage Hospital, Maryport		C. Eaglesfield, Architect, Maryport	do.
School and Residence	Clutton (Somerset) School Board	W. F. Bird, Architect, Midsomer Norton	do.
Improvements to Cottage, Pandy, Wales		E. Foster, Architect, Bella Vista, Abergavenny	Mar. 1
Additions, &c., to Assembly Rooms	Llangollen U.D.C.	E. F. Jones, Council Offices, Llangollen	do.
Theatre, Ashby-road, Loughborough	Mr. G. H. Wilmot	Barrowcliff & Allcock, Architects, Loughborough	do.
Additions to Schools, Bowes, near Darlington		Rev. C. B. Wardle, The Vicarage, Bowes	do.
Library, Ballymacarratt	Belfast Corporation	Blackwood & Jury, Architects, 41, Donegall-place, Belfast	do.
Boundary Wall, St. John's Church, Fenwick-Cum-Moss		Rev. F. H. Allen, Moss Vicarage, Doncaster	Mar. 2
Road and Sewer Works	Hornsey U.D.C.	Council's Engineer, Southwood-lane, Highgate, N.	Mar. 3
Sewerage Works	Slough (Bucks) U.D.C.	W. W. Cooper, Engineer, Mackenzie-street, Slough	do.
Rebuilding Whilton Bridge	Northamptonshire County Council	C. S. Morris, County Surveyor, County Hall, Northampton	do.
Three Shops & Offices, Glebeland-st., Merthyr Tydfil		C. M. Davis, Architect, 112, High-street, Merthyr	do.
Ten Dust Vans	Islington Council	Council's Engineer, Town Hall, Upper-street, N.	do.
Annual Contracts	Tottenham U.D.C.	The Clerk, 712, High-road, Tottenham	Mar. 4
Temporary Hospital	Rugby U.D.C.	Council's Surveyor, Rugby	do.
Annual Contracts	Lewisham Borough Council	Council's Surveyor, Town Hall, Catford	do.
Bridge Works, Penhilweiber	Mountain Ash U.D.C.	J. Williams, Surveyor, Town Hall, Mountain Ash	do.
Street Girder Work for Power Station	St. Pancras Borough Council	Electricity Department Offices, 57, Pratt-street, N.W.	do.
Annual Contracts	Fulham Borough Council	Town Clerk, Town Hall, Fulham, S.W.	Mar. 5
Wood Paving and Cleft Oak Fence	do.	Council's Surveyor, Town Hall, Fulham, S.W.	do.
Water Supply Works, Chale	Isle of Wight R.D.C.	H. Eldridge Stretton, Council Offices, Ryde	do.
Street Works, Green-lane, Station-lane, &c.	Halesowen R.D.C.	W. Whitworth, Surv., Public Offices, Great Cornbow, Halesowen	do.
Road Materials	South Shields Corporation	S. E. Burgess, Civil Engineer, Chapter-row, South Shields	do.
Receiving Wards, &c., at Infirmary	Wandsworth & Clapham Union	Lanadell & Hamson, Architects, 65, Basinghall-street, E.C.	do.
Committee Rooms, &c., at Town Hall	Metropolitan Boro' of Bermondsey	R. J. Angel, Borough Surveyor, Town Hall, Spa-road, S.E.	Mar. 6
Restoration of St. James's Church, Hereford		Nicholson & Hartree, Architects, Hereford	do.
Water Vans and Carts, and Tar Boiler	Woolwich Council	Council's Engineer, Maxey-road, Plumstead	do.
Steam Roller Shed, and Cart Shed	do.	do.	do.
Surveyor's Materials	Bath U.S.A.	City Surveyor, Town Hall, Bath	Mar. 8
Water Supply Works, Barrington	Langport R.D.C.	Bailey-Denton, Son, Lawford & Symons, Engineers, 9, Bridge st	Mar. 10
Setts, Kerb, &c.	Batley (Yorks) Town Council	C. J. Kirby, Surveyor, Market-place, Batley	do.
Paving Jubilee-street and Turner-street	Metropolitan Borough of Stepney	Borough Engineer, 15, Great Alie-street, Whitechapel, E.	do.
Electric Generating Station and Offices	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	Mar. 11
Postal Sorting Office, Hull	Commissioners of H.M. Works, &c.	H.M. Office of Works, Storey's Gate, S.W.	Mar. 12
Road Works	Bridport R.D.C.	J. W. T. Bartlett, Surveyor, 72, West Bay-road, Bridport	do.
Buildings for Infirmary, Knotty Ash	Liverpool Select Vestry	Kirby & Willink, Architect, 5, Cook-street, Liverpool	Mar. 17
Extension of Union Workhouse	Newmarket Union	Holland & Sons, Architects, High-street, Newmarket	do.
Drainage Works	Cheshire County Asylum	County Architect, Newgate-street, Chester	Mar. 22
Laying Sewers and other Works	Tewkesbury R.D.C.	Council's Clerk, Tewkesbury	Mar. 24
Five Cottages	Kent County Asylum	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	Mar. 26
Two New Board Schools	York School Board	Demaine & Brierley, 13, Lendal, York	No date
House, Blaenau-Ffestiniog, Wales	Mr. W. Pakeman	R. Evans, Crynga Mawr, Wales	do.
Additions to College, Belfast	Mr. C. O. Liddell	J. J. Phillips & Son, 61, Royal-avenue, Belfast	do.
Hotel, Totnes, Devon	Farnborough U.D.C.	Starkey, Knight & Ford, Limited, Paignton	do.
Alterations to two Houses, St. John's-street, Coventry	Gainsborough R.D.C.	Harrison & Hattrell, Architects, 23, Hertford-street, Coventry	do.
Alterations to St. Stephen's Schools, Elton, Bury, Lancs.		D. Hardman, Architect, Agur-street, Bury	do.
Alterations to Shirenewton Hall, Chepstow	The Rt. Hon. the Earl of Denbigh	Newland & Co., Architects, 19, Commercial-street, Newport, Mon.	do.
Stone Kerbing	Abingdon R.D.C.	J. E. Hargreaves, Surveyor, Town Hall, Farnborough	do.
Road Metal (11,000 tons)	Staines R.D.C.	R. Maxwell, Surveyor, Gainsborough	do.
Sinking Well, Shimpling, near Bury St. Edmunds	Colonel the Hon. W. Alexander	H. Biddell, Playford, Ipswich	do.
Reservoir Embankment, Ysceifiog, near Mold	Primitive Methodist Trustees	T. B. Farrington, Civil Engineer, Trinity-square, Llandudno	do.
Broken Granite (7,000 tons)	Mr. J. Daniel	B. & E. M. Challenor, 59, Stert-street, Abingdon	do.
Broken Granite	Salford Corporation	G. W. Manning, Surveyor, Council Offices, Staines	do.
Alterations to Church Farm, Sutton Veney, Wilts	W. H. Newall, Esq.	H. F. Price, Architect, Weston-super-Mare	do.
Chapel, Hereford		W. W. Robinson, Architect, Hereford	do.
Four Houses, Pontnewynydd, Wales		G. H. Daniel, Clarence Chambers, Pontypool	do.
Alterations to House, Drinkwater Park		H. Lord, Architect, 47, Deansgate, Manchester	do.
Two Cottages, Hamilton-road, Salisbury		J. Harding & Sons, Architects, Salisbury	do.
Factory, Leyton, Essex			do.

[See also next page.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Resident Engineer for New Sewerage Works	Stamford Corporation	4*l.* 4*s.* per week	Feb. 26
*Timekeeper	Metropolitan Boro' of Bermondsey	120*l.*	Mar. 3
*Assistants (Architect's Department)	London County Council	4*l.* 10*s.* per week (not exceeding)	do.
*Architectural Assistants (Architect's Department)	do.	do.	do.
*Sanitary Inspectors (2)	Hampstead Council	120*l.* each	do.
*Clerks of Works (2)	Lewisham Borough Council	3*l.* 3*s.* per week each	Mar. 4
*Junior Building Surveyor	London County Council	2*l.* per week	do.
*Inspector of New Buildings and Drainage Work	Hornsey U.D.C.	160*l.*	Mar. 8

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. xii. & xxiv. Public Appointments, xvi. & xxiv.

TO CORRESPONDENTS.

M. & F. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under took, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ACTON GREEN.—For making and sewering, including branch drains, Temple and Weston roads on the Kingswood Park Estate, Acton Green, W. Mr. Edward Monson, architect and surveyor, Acton-vale, W., and 22, Buckingham-street, Adelphi, W.C.:—

Meston & Hale	£2,092	F. Smith	£1,568
Kavanagh & Co.	1,881	I. Macklin	1,550
T. Adams	1,835	H. Boyer	1,532
Felkin & Watson	1,828	R. Clarke	1,430
Killingback & Co.	1,700	R. W. Swaker	1,330
C. Ford	1,689	W. H. Wheeler	1,307
H. Morecroft	1,678	A. C. Soan	1,280
Carpenter & Willis	1,664	Woodham & Sons, Catford, S.E.*	1,245
Nowell & Co.	1,636		
Wimpey & Co.	1,625		

BATLEY.—For extensions to schools, Hanover-street. Messrs. C. H. Marriott, Son, & Shaw, architects, Church-street Chambers, Dewsbury:—

Masonry.—J. Oldroyd, Batley *
Joinery.—W. H. Clegg, Dewsbury*
Slating.—W. H. Thompson, Batley*
Plumbing.—J. Walshaw, Batley*
Plastering.—Samuel Crawshaw, Batley*
Ironfounding.—Bagshaw & Sons, Batley*

} Estimated total cost of works, £2,800, including furnishings, &c., not included in these contracts.

BEESTON (Yorks).—For the erection of stables and two houses, Millshaw, for Mr. W. L. Ingle. Messrs. T. A. Buttery & S. B. Birds, architects, Queen-street, Morley:—

John Brayshaw, Studley-terrace, Leeds	£130	0	0
Joinery.—J. W. Binks & Sons, Morley	169	0	0
Plumbing.—A. Fawcett, Peel-street, Morley	25	10	0
Plastering.—E. Wilson, Morley	15	2	4
Slating.—J. W. Binks & Sons, Morley	42	0	0

CAMBRIDGE.—For erecting the Cambridge and County Boys' School, Hills-road. Messrs. A. P. MacAlister & E. J. Tench, architects, Cambridge:—

	With Terra-cotta Dressings.	With Stone Dressings.
J. Shillitoe & Son	£8,200	£8,130
S. Foster	7,850	7,793
J. P. White	7,777	7,634
A. J. Bateman	7,670	7,573
W. Sindall	7,642	7,560
W. Saint	7,624	7,498
W. Bell & Sons	7,324	7,397
The Oak Building Co.	7,281	7,213
Willmott & Son	7,108	7,059
Gimson & Co.	7,099	7,044
H. J. Linnell	6,986	6,908
Kerridge & Shaw	6,892	6,924
Coulson & Lofts, Cambridge*	6,720	6,630

CORK.—For the erection of two pairs of semi-detached villas, Blackrock-road. Messrs. W. H. Hill & Son, architects, South Mall, Cork:—

J. A. O'Connell, Clarkes Bridge, Cork* .. £2,000

DARLINGTON.—For the erection of a pair of semi-detached cottages, Corporation Farm, for the Corporation. Mr. Thos. Smith, Borough Surveyor, Town Hall, Darlington. Quantities by Borough Surveyor:—

Excavating, Bricklaying, Stonemasonry, and Plastering Work.

Wm. Robinson, Barton, Darlington* £335 10 0

Carpentering and Joinery Work.

J. H. Stephenson, Darlington* £163 2 0

Slating Work.

Wharton Bros., Darlington* £52 10 10

Plumbing and Glazing Work.

Thomas Armitstead, Darlington* £52 0 0

Painting Work.

Wm. Hornby, Darlington* £12 6 8

DOWNDERRY (Cornwall).—For the erection of a villa residence, for Mr. H. W. Rock, of Plymouth. Mr. J. H. Vincent, architect, 74, Old Town-street, Plymouth. Quantities by architect:—

W. E. Blake	£1,019	W. Stephens	£783 16
R. & J. Andrew	935	A. E. Rickaby	768 4
J. H. Blackell & Son	925	A. Truscott, 19, Market-street, Stonehouse, Plymouth*	760
A. Andrews	880		
W. Gibson	810		

GWYRFAI (Carnarvon).—For the execution of waterworks, for the Rural District Council. Mr. E. Evans, C.E., 8, Castle-street, Carnarvon. Quantities by engineer:—

David Owen	£3,971 14 6	E. Ariel Chase	£2,466 12 3
Wm. Thomas	2,935 0 0	Robt. A. Crowe, Deansgate, Manchester*	2,389 16 4
Evan Jones	2,850 0 0		
Richard Jones	2,564 3 5		

HULL.—For the erection of cement kilns, offices, &c., Stoneferry, for Messrs. Burstall & Co., Ltd. Messrs. Gelder & Kitchen, architects, 76, Lowgate, Hull:—

Geo. Jackson & Sons, Whitsans, Hull* £1,126 3 8

LEEDS.—For the erection of a police-station and library, Harrogate-road and Town-street, Chapeltown, for the Corporation. Mr. W. H. Thorp, architect, 61, Albion-street, Leeds. Quantities by the architect:—

Masonry and Bricklaying.—J. Richardson Chapeltown*	£1,670	0	0
Carpentry and Joinery.—Banks Mawson, Sheepscar, Leeds*	1,295	0	0
Plumbing and Glazing.—Bedford & Son, Chapeltown*	806	17	0
Ironfounding.—Dixon Pawner, Hartley Hill, Leeds*	463	14	6
Slating.—J. Season, Hunslet-road, Leeds*	146	0	0
Plastering.—T. Moore, Concord-street, Leeds*	433	0	0
Painting.—Jenkins, Tollerton, & Co., Merrion-street, Leeds*	101	0	0
Electrical Engineer.—Dixon & Son, Boarlane, Leeds*	198	0	0
	£5,203	11	6

LONDON.—For extensions to electric light station, Coronet-street, for the Shoreditch Borough Council. Mr. J. Rush Dixon, C.E., Town Hall, Old-street, E.C.:—

Johnson & Sons	£3,414	Chas. Ansell	£2,050
Pollard & Brand	2,700	H. L. Holloway	2,230
H. B. Neal	2,554	Gardner & Hazell	2,216
Chessum & Sons	2,497	Yates & Co.	2,199
W. Reason	2,390	Spencer, Santo, & Co., Ltd.	2,152
Kiddle & Sons	2,385	Wilson Bros. & Lamplough, Notting Hill, W.*	2,069
W. H. T. Kelland	2,347		
F. G. Minter	2,312		
Smith & Son, Ltd.	2,279		
A. Porter	2,251		

[Borough Surveyor's estimate, £2,300.]

LONDON.—For alterations and additions to the Victoria House, Burdett-road, for Mr. F. Baker. Mr. J. M. H. Gladwell, architect, Boston House, 63 and 64, New Broad-street, E.C.:—

W. J. Maddison Cocks, Ltd.	£524 498	A. E. Symes*	£478

LONDON.—For the erection of a warehouse on the south-east quay of the Limehouse Basin, for the Regent's Canal and Dock Co. Plans and quantities by Messrs. Thomas & Thomas, Paddington:—

Patman & Fotheringham	£7,283	Sheffield Bros.	£6,495
Bull & Eadaile	7,000	Johnson & Co.	6,473
Johnson & Sons	6,962	Kirk & Randall	6,443
Godson & Sons	6,924	W. Gladding	6,388
Chessum & Co.	6,700	Holliday, Greenwood, & Co.	6,387
Perry & Co.	6,659	Lovatt & Co.	6,340
J. C. Richards	6,633	Watts, Johnson, & Co.*	6,157
J. R. Ward	6,526		

MARPLE.—For the erection of National School buildings. Messrs. Jas. Hunt & Son, architects, 4, Warren-street, Stockport:—

Neil & Son	£2,500	J. Briggs	£2,220
Partington & Son	2,500	Daniel Edie	2,178
James Pott	2,342	M. Lane	2,150
Broadhurst & Co.	2,300	Robinson & Sons, Hyde*	2,119
Jos. Broadhurst	2,290		

NOTTINGHAM.—For the erection of a pair of semi-detached villas Sherwood Rise. Messrs. Collyer & Slater, architects, 8, Bridlesmith-gate, Nottingham. Quantities by architects:—

A. B. Clarke	£1,200	A. T. Key	£1,033
Hutchinson & Son	1,150	W. Appleby	1,020
T. Cuthbert	1,140	W. Maule	1,015
S. Parnell	1,120	T. Whittaker, Traffic-street*	1,010
G. T. Lovett	1,100		
T. Long	1,090		

[All of Nottingham.]

[Plumbing, electric lighting, and painting to be let separately.]

STAMFORD.—For sewerage work. Mr. J. B. Everard, M.Inst.C.E., Leicester:—

Contract No. 1.

Nowell & Son	£91,144	2	4
J. Mackay	59,912	3	0
T. Philbrick	55,620	0	0
J. Jackson	53,955	6	5
J. H. Vickers, Ltd.	51,111	4	6
C. Chamberlain	49,516	3	3
H. Ashley	47,953	0	0
G. Osenton	47,363	5	11
J. T. Binns	45,265	2	11
H. Tyson	44,942	15	0
G. Bell	44,658	0	0
F. Barlow	44,457	7	0
W. G. Willmott	44,308	0	0
Johnson & Langley	41,609	9	0
Jones & Son	41,223	0	0
Perkins, Craig, & Co.	41,100	6	0
Moss & Sons	40,661	0	0
J. Dickson	40,055	0	0
Cooke & Co.	32,576	0	0
Braithwaite & Co.	39,068	0	
G. F. Tomlinson	37,590	0	0
Wilkinson Bros.	35,552	0	0
F. N. Simpson	34,487	16	4
J. S. Dawson	34,406	11	3
Bentley & Sock	34,131	14	0

Contract No. 2.

Bax & Dawson	£2,567	13	7
J. Jackson	2,194	4	9
W. & M. Hawkes	1,740	17	0
Moss & Sons	1,726	9	0
F. D. Goodwin	1,638	19	6
C. Chamberlain	1,600	10	0
Bowman & Son	£1,595	10	0
Riddett & Son	1,587	0	0
J. Woolston	1,497	0	0
T. W. Rowe	1,471	13	6
Hinson & Co.	1,456	19	6

TEIGNMOUTH.—For alterations at Wilts and Dorset Bank. Messrs. Bridgman & Bridgman architects, Torquay and Paignton. Quantities by Mr. Vincent Cattermole Brown, Paignton:—

Fredk. C. Francis £1,630
Hugh Mills, Newton Abbot* 1,500
[Architects' estimate, £1,550.]

[*See also next page.*

WEST HAM.—For the erection of a block of school buildings and appurtenances, to be known as the Holborn-road Schools, Canning Town, E., for the West Ham School Board, under the direction of Mr. W. Jacques, 2, Fen-court, Fenchurch-street, E.C., Architect to the Board. Quantities by Messrs. R. L. Curtis & Sons:—

B. E. Nightingale	£32,343	W. Gladding	£29,269
A. E. Symes	31,293	W. J. Maddison	28,993
Battley, Sons, & Holnese	29,416	G. Sharpe	28,744
Stimpson & Co.	29,286	Gregar & Son	28,100
		A. Reed‡	27,976

‡ Accepted, subject to the approval of Board of Education.

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect:—

* *Recommended for acceptance.*

FURNITURE STORES (Clerkenwell).—Purchase and clearing away of old metal and wood, on a running contract:—

	Metal. Per cwt.		Wood. Per cubic yard.
	s. d.		s. d.
J. Ashton	1 6½	....	1 4½
Bird & Co.	1 0	....	—
J. Kelley	0 9⅝	....	4 6
A. Learoyd, jun.	1 4	....	—
Longman & Son	1 7	....	—
J. A. Richardson	†1 3	....	3 0
Worms & Son*	1 7½	....	5 3

† This price is for wrought and cast iron. The contractor also quotes 3d. per cwt. for light iron, scuttles, &c.

GREENWICH (LUCAS-STREET).—Improvements: Providing new halls, 50 ft. by 28 ft., for all departments; new staircases for boys' and girls'; new additional cloak-rooms for all departments; re-dividing and re-stepping and providing additional lighting to existing classrooms for all departments; providing new water-closets and covered playgrounds for all departments; providing new drainage scheme; enclosing, draining, and tar-paving the additional land; new heating scheme by low-pressure hot-water appliances. Revised accommodation: Boys', 318; girls', 318; infants', 318—total, 954. Net loss, 68 places:—

F. & H. F. Higgs	£15,847	J. & M. Patrick	£11,306
W. Downs	14,797	J. & C. Bowyer	13,286
Wallis & Sons	14,234	C. Cox	13,149
Holliday & Greenwood, Ltd.	14,030	Kirk & Randall	12,834
Garrett & Son	13,663	Smith & Sons, Ltd.	12,597
Lawrance & Sons	13,570	Stimpson & Co.*	12,400

Supply of RADIATORS, on a running contract:—

	Price per sq. ft. of heating surface.
	s. d.
The Coalbrookdale Co., Ltd.	7 0!
Wenham & Waters, Ltd.	1 7
Robert Clarke	1 5½
The Brightside Foundry and Engineering Co., Ltd.	1 4½
Kissell & Co., Ltd.	1 4
Unsigned	1 3½
Hayward Bros. & Eckstein, Ltd.	1 0½!

Supply of BENTWOOD STOOLS, on a running contract:—

		s. d.
The (Original) Austrian Bentwood Furniture Co., Ltd.*	each	3 9
Thonet Bros.	,,	3 6
Schoolbred & Co.	,,	3 4½
G. J. Levy	,,	2 10½

Supply of the following articles, on running contracts:—

TABLES (Kitchen):—

	Each.		Each.
Syer & Co.	£2 10 0	General Builders, Ltd.	£1 6 0
Fisher, Son, & Weaver	1 14 0	R. H. Galbraith	1 2 9
North of England School Furnishing Co., Ltd.	1 7 6	Wrinch & Sons	1 1 0
		H. Bouneau*	0 19 8

IRONING STOVES (Gas):—

	Each. s. d.		Each. s. d.
Summerscales & Sons, Ltd.	9 9	Fletcher, Russell, & Co., Ltd. (less 30 per cent.)*	9 9

UNIONS for Hose Connexions:—

	Per doz.		Per doz.
Pryke & Palmer	£1 1 0	Davis & Co., Ltd.*	£0 11 9
T. & W. Farmiloe, Ltd.	0 18 0		

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